ROCKS AND MINERALS

MINERALOGY
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JANUARY - FEBRUARY, 1955
Whole Number 244

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ROCKS AND MINERALS

Box 29 **Peekskill, N. Y.**

ROCKS and MINERALS

PETER ZODAC, Editor and Publisher

America's Oldest and Most Versatile Magazine for the Mineralogist, Geologist, Lapidary.

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CHIPS FROM THE QUARRY

Coming Events

Southwest Federation of Mineral Societies, Exposition Building, on Shorline Drive, Corpus Christi, Texas—May 6, 7, 8, 1955.

"Your 1955 Host on the Coast" is Gulf Coast Gem and Mineral Society, P.O. Box 7425, Corpus Christi, Texas (Richard W. Cline, Show Chairman).

Huge Barite Collection to be exhibited!

Editor R & M:

On March 14, 1955, I am exhibiting my collection of Barium Minerals at Schuster's Greenville, Penn. It will be open to the schools and college students, the public also, between 2:30 PM & 4:30 PM.

At 6:30 PM there will be a dinner, by invitation only, and I will speak on my hobby at 7:30 P.M. Reservations must be made not later than March 1st. (Dinner only)

This exhibition is sponsored by the *Greenville Business Mens Association* with the service clubs as their guests. All mineral collectors are welcome. Further information can be obtained from the Sec. of the above Ass'n. This will be the only showing in this area (200 mi. rad.) There will be at least 125 Barium specimens from 25 States and 12 foreign countries."

Emmett Klopfenstein
Box 162
Greenville, Pa.

Dec. 18, 1954

Unfair Criticism!

Editor R & M:

Nothing much to write about. No this isn't a complaint—just a question:

May I ask why Rocks and Minerals is always two months behind, as very often the offers in the ads have expired. You know on the West coast we are about two or three months in advance. Why don't you Easterners catch up?

Anyway, you have the best magazine in print, even if it is late.

Al Thrower
P. O. Box 305
Santa Cruz, Calif.

August 29, 1954

Editor's Note:—This is an unfair criticism. R & M does not come out 2 months late. Its publication date is the 20th of the even months, (February, April, June, August, October, December — see bottom of Contents page). The November-December 1954 issue came out Dec. 9th (11 days in advance). Perhaps Mr. Thrower does not realize the magazine comes out once every 2 months—so it is 2 months between issues. Even if it does come out late, isn't it better to be late then never?

Rockhound Mother of the year!

Editor R & M:

I'm taking the opportunity to tell you of the thrilling Mineral hunting trip we had last May through Virginia, and North Carolina. From the Amazonstone location in Amelia Courthouse to Mr. Scroggs' (and particularly *Mrs.*) hospitality in North Carolina, our trip was a huge success both in education, color pictures, and most important, meeting people of similar interests but of widely different backgrounds.

After we overcame the first, and natural, I suppose, suspicion of the landowners where we visited, we had wonderful experiences in digging rubies at Franklin, N. C., prospecting at the old emerald mine at New Switzerland, N. C., and picking up (easy as pie!) the fabulous fairy stones (!) of Brasstown, N. C. We followed the trip of the Washington Mineral Club in the travel issue of the LAPIDARY JOURNAL, but got most of our information from old copies of ROCKS AND MINERALS and THE COMPRESSED AIR magazine.

At this time may I nominate for Rockhound Mother of the year (or a more artistic title if you can think of it) Mrs. Fred O. Scroggs of Brasstown, N. C. Of course *Mr.* is the collector, but *Mrs.* is my candidate for A #1 all-around best advertiser for our hobby of rocks and minerals.

She treated us royally while we took up her husband's time, fed us well and then personally escorted us to the location of the curious crosses so interesting to collectors. Mr. told us of the huge mining operations not far from there, but like all others, our time is always limited at the wrong time! Best regards to you Editor, as always—

Mrs. L. W. Schoppee
9 Greenbrier St.
Springfield 8, Mass.

Sept. 5, 1954

Met some wonderful people!

Editor R & M:

The little note in the July-Aug. R & M about our ad results really brought the response. Haven't caught up yet, so will hold off on another ad for awhile. Really "met" some wonderful people thru our letters—will write you later about our N. C. trip and visit to one of our friends—met thru the ad.

Mrs. Paul F. Armstrong
P. O. Box 352
St. Petersburg, Fla.

Nov. 10, 1954

THE MINERALOGY OF FOSSILS

With Remarks on Alterations, Pseudomorphs, Replacements, and False Fossils

By JAMES H. BENN 1/

Member of the Geological Staff of the U. S. National Museum, and Treasurer of the Eastern Federation of Mineralogical and Lapidary Societies

1/ Published by permission of the Secretary of the Smithsonian Institution.

In quest of beautiful mineral specimens, collectors oftentimes overlook some of the most intriguing and occasionally the most bizarre forms created in the realm of the mineral kingdom. Many people collect for the mere pleasure of getting out in the open, and the satisfaction of assembling nature's handiwork in personal collections to exhibit to their friends; others love to collect and identify because of the educational value such an adventure affords. To both, mineralogy offers a volume of interest and a multitude of ties to the whole world round about. Keeping this in mind, all may agree with the psalmist, "He maketh me to lie down in green pastures; He leadeth me beside the still waters; He restoreth my soul."

The knowledge gained through the science of mineralogy concerning the structure of the earth may with great advantage be applied to paleontology, the science of fossils or, to be more explicit, the study of past life. Without the ability of certain minerals to take over, to replace and to retain organic structures and form, the study of fossils would be a sorry science indeed. It is therefore my desire to focus attention in this paper on some of the peculiar phenomena associated with fossilization. Before doing so, however, it is pertinent that a brief review of certain observations and facts dealing with the formation of minerals, their interchangeability, alterations, replacements, pseudomorphs, fillings and impregnations be made. Minerals may originate in various ways. Some have been formed from water solution (veins, spring deposits, secondary minerals in cavities) either by concentration of solutions or by chemical reactions. Some have been formed by separation from a molten magna (minerals of igneous rocks, such as granites, rhyolites, basalts, etc.). Others have been formed by organisms and still others by the chemical readjustment incident to metamorphism. To determine the method of formation and source of the material is an important part of mineralogical investigation.

Many minerals have been formed in several different ways and this fact is often indicated by a peculiarity of habit. Thus, orthoclase is usually formed from fusion as in granites and rhyolites, but vein orthoclase (valencianite) has a pseudo- orthorhombic habit quite different from that found in igneous rocks.

On account of the difficulty of determining the origin of minerals, it is convenient to base the varieties principally upon their mode of occurrence. Paragenesis is the term used for the association of minerals with special reference to their occurrence and origin. Such minerals are designated by the term paragenetic varieties. However, it is not possible to establish paragenetic varieties for all minerals at present, and in any case there may be a difference of opinion among investigators. As an example of paragenetic varieties, calcite might be considered. It may occur as a vein mineral, often as the gangue of metallic ores; as travertine, calcareous tufa and cave deposits; as a biogenic (organic origin) mineral forming limestones; as a secondary mineral in basic igneous rocks, as a secondary mineral in seams and cavities of sedimentary rocks, and as the recrystallized material of crystalline limestone such as marble, a metamorphic rock.

Not only the origin, mode of occurrence and mineral association but also the order of successive crystallization is valuable in determining paragenetic vari-

eties.

In the Joplin lead and zinc district of southwest Missouri the minerals crystallizing free in cavities usually exhibit the following sequence: dolomite, galena, sphalerite, chalcedony, marcasite, and calcite. In veins, quartz is usually the first mineral to crystallize out, though it may also occur in a second generation. Minerals formed subsequent to the main rock mass are thus called secondary.

Ofttimes mineral synthesis (minerals which have been produced artificially) gives a clue to natural origin. Many minerals have been produced artificially — the emerald being but one example. A further demonstration of mineral synthesis is the production of covellite (copper sulfide) by heating powdered sphalerite (zinc sulfide) in a water solution of copper sulfate, using an atmosphere of carbon dioxide. After a few hours a blue-black powder (covellite) appears. In the Joplin district covellite after sphalerite has been found, so that this reaction has doubtless taken place in nature. Geologic time is partly compensated for by increased temperature and pressure.

Intermediate between the synthetic minerals and those occurring naturally are the minerals which have been formed on mine-tools, prehistoric implements, old coins and other such objects. In these instances man has unintentionally furnished part of the material but has not directed the conditions governing the formation of the minerals. Cuprite, malachite, azurite and cerussite have been identified on buried Chinese coins of the Seventh Century found at Kiukiang, China. In the hall of Egyptology of the National Museum may be seen vases and artifacts made of copper showing traces of the green coloring of malachite. Likewise, many oriental objects of great antiquity are displayed in the Freer Gallery of Art in Washington, D. C., showing mineral transitions from the original substances. An ancient bronze ceremonial vessel, size 15″ x 10-3/16″ x 8-15/16 inches, of the Chou Dynasty (1122-756 B. C.), is pictured on plate I, figure 1, revealing alteration of the original alloy metal to malachite. Also, on plate I, figure 2, is shown a metallograph of a portion of an ancient object, made by Daniel Cushing of Boston, Massachusetts, revealing the internal dendritic crystal structure of the cast metal which has been exposed by natural etching of ground water of the soil in which it was entombed. The corrosion processes have also caused the formation of cuprite in the metallic areas and redeposited copper in the white areas.

A classic example of unintentional mineral production by man is that of the old Roman baths at the thermal springs of Bourbonne-les-Bains in France. Here bronze coins thrown in the springs as votive offerings have been found incrusted with such minerals as chalcocite, chalcopyrite, bornite and tetrahedrite. Zeolitic minerals have also been found formed in the conduits of the springs.

Many minerals quite often show evidences of alteration, especially around the borders. See plate 2, fig. 1. The more common chemical changes involved are oxidation, such as sulfides to sulfates, sulfides to oxides, arsenides to arsenates, and so on, and carbonation such as sulfides to carbonates. There are also more complex changes which space does not permit us to discuss. However, the following may be mentioned as prominent alterations, many of them occurring as pseudomorphs: galena to cerussite, pl. 2, fig. 1 sphalerite to smithsonite, pyrite to limonite, smaltite to erythrite, cuprite to malachite, olivine to serpentine (serpentinization), augite to hornblende (uralitization), and orthoclase to sericite, a variety of muscovite mica, the process being called sericitization.

The pseudomorphs are peculiar and rather fascinating because of their deceptive, untrue or false forms. They are usually crystalline with definite shape belonging, not to the substance of which they consist but to some other substance which has wholly or partially disappeared. Thus limonite, so common in many localities, although it never crystallizes is often found in cubes. One may see by breaking the crystals that the cubes were originally pyrite and were changed to limonite by oxidation. Hence, a limonite pseudomorph from pyrite; see

PLATE I

Fig. 1. Ancient Chinese bronze vessel, rough areas altered to malachite. Courtesy of Mr. Archibold G. Wenley, Freer Gallery of Art.

Fig. 2. Metallograph made by Daniel Cushing, Boston, Massachusetts, of a section of an ancient cast metal object revealing natural etching by ground waters and the formation of cuprite in the metallic areas and copper in the white areas by corrosion. Courtesy of Mr. Rutherford J. Gettens, Freer Gallery of Art.

plate II, fig 2. Pseudomorphs may be classified as follows:

1. Substitution pseudomorphs where there is an interchange of substance not involving alteration.

2. Alteration pseudomorphs in which there is either loss, gain, or interchange of some constituent.

3. Paramorphic pseudomorphs or paramorphs, where a change of the molecular structure of a mineral without alteration of external form or chemical constitution has taken place.

Sometimes quartz is found in the form of fluorite crystals and again in the form of selenite crystals. In both cases the fluorite and the selenite have been replaced by a process of substitution into quartz, or better still, silica; such crystals are pseudomorphs by substitution. Another illustration is that of cassiterite replacing orthoclase. Examples of these and other pseudomorphs formed by this process is illustrated on plate II, figures 3-12.

A more common and important class of pseudomorphs includes those formed by the chemical alteration of the original minerals; these are illustrated by pseudomorphs of native copper from the oxide of copper, cuprite, (plate 3, fig. 1) where there has been the loss of one constituent, in this case the oxygen; also of gypsum from anhydrite where the anhydrous calcium sulfate has become hydrous sulfate by the acquisition of water; or still more important, where there has been a more or less complete exchange of constituents, as of the lead carbonate cerussite from the lead sulfide galena, (plate 2, fig. 1) or of chlorite from garnet, (plate 3, fig. 2) or lazulite from feldspar, (plate 3, fig. 3). See plate 2, figs. 1-2 and plate 3, figs. 1-5 for examples of pseudomorphs by alteration.

Pseudomorphs are also formed by molecular change without change of chemical substance, as of calcite after aragonite, or rutile after brookite; these pseudo-forms are called paramorphs. Rutile after brookite is illustrated on pl. 3, fig. 6.

Very often pseudomorphs have a non-crystalline waxy lustre, but this is not necessarily always the case for some, such as the paramorphic rutile just mentioned, have high lustre.

Then there is the metasomatic replacement which is a geological term implying the replacement or substitution of a rock or vein by ore-bearing solutions. One of the best example is a fine granular galena with the form and structure of limestone and formed by the replacement of the limestone by galena, molecule by molecule, so that the structure is retained.

In reviewing nature's processes of mineral changes, we must not overlook fillings, impregnations and the preservation of vast amounts of vegetable matter, such as coal.

Agate, the joy of all rockhounds and the delight of gem cutters, is a variegated chalcedony, either banded or clouded, belonging to the silica group of minerals. It is a good example of the filling of cavities in rock by a mineral deposited from solution, which has percolated through the surrounding matrix. The banding is generally concentric and the alternate colors are due to the impurities in the solution from which the mineral

PLATE II

Fig. 1. Galena crystal broken to show surface alteration to cerussite. Webb City, Jasper County, Missouri. U.S.N.M. 82204
Fig. 2. Pyrite to limonite. Utah. U.S.N.M. R-2188.
Fig. 3. Fluorite to quartz. Cornwall, England. U.S.N.M. 82100.
Fig. 4. Selenite to quartz. Sioux County, Kansas. U.S.N.M. 106749.
Fig. 5. Orthoclase to cassiterite. Cornwall, England. U.S.N.M. 13431.
Fig. 6. Mica to quartz. Near Hot Springs, Arkansas. U.S.N.M. 45203.
Fig. 7. Datolite to quartz. Devonshire, England. U.S.N.M. 84676.
Fig. 8. Barite to quartz. Pike's Peak, Colorado. U.S.N.M. C-1244.
Fig. 9. Aragonite to copper. Corocoro, Bolivia, U.S.N.M. C-174.
Fig.10. Glauberite to calcite. Coast of Alaska, Arctic Ocean. U.S.N.M. 106785.
Fig. 11. Glauberite to gypsum. Camp Verde, Arizona. U.S.N.M. 106173.
Fig. 12. Wulfenite to quartz. New Mexico. U.S.N.M. C-1263.
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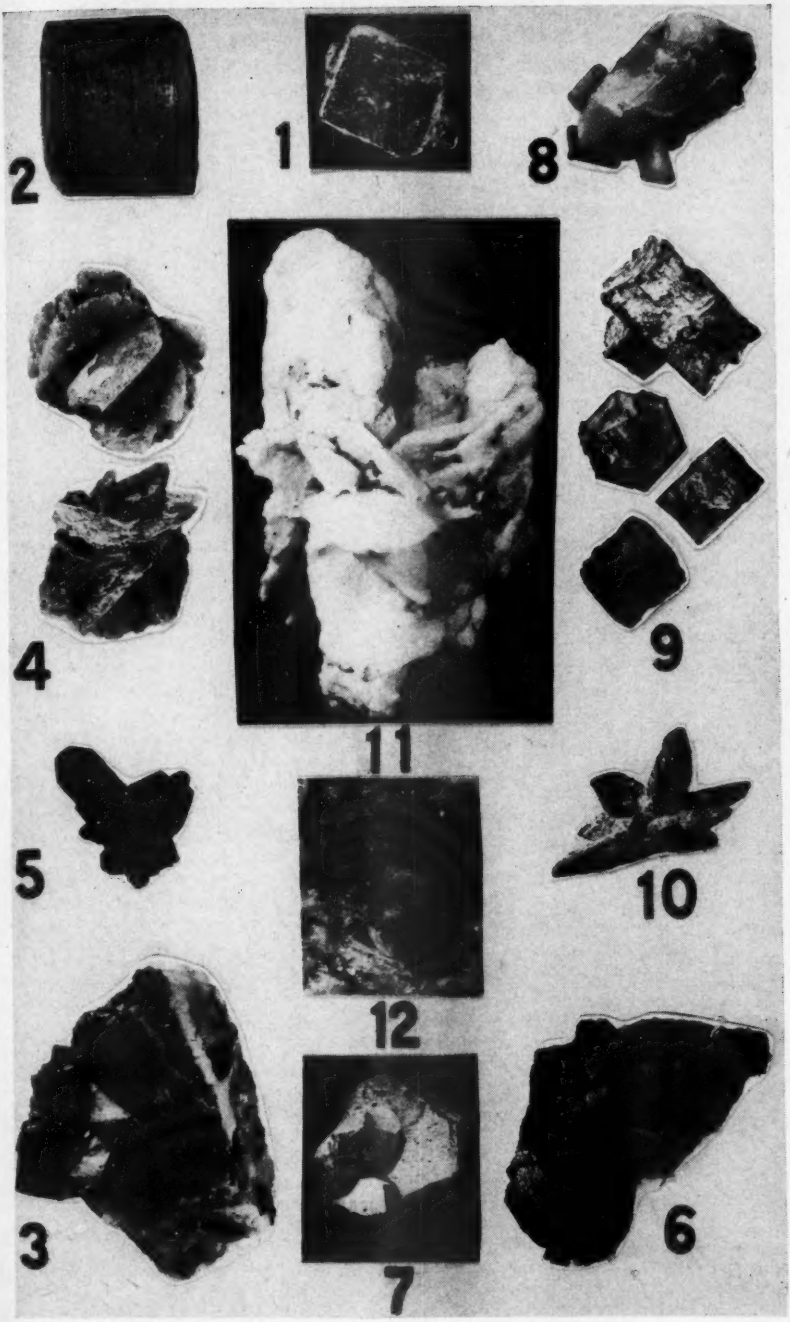
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was deposited. Clouding and the so-called "moss", "landscapes", and "plumes" represent the impregnation of metallic oxides and minerals such as chlorite, tremolite and others, when the silica was yet unhardened and still in a receptive state. These impregnations into the fillings produce very beautiful stones when cut by careful and imaginative craftsmen. In the national collection of gems there are excellent examples of all types. On plate IV, fig. 4 is pictured landscape or moss agates. The scenes are formed by oxides of manganese and iron.

There is also another school of thought concerning moss in agates which should be considered at this point. Dr. Frank L. Hess, retired chief mineralogist of the U. S. Bureau of Mines, has assembled over the years a remarkable series of agates illustrating impregnations which greatly resemble forms having organic origin. Three samples have been selected from his collection for illustration on plate IV. Figure 1 is chalcedony from the exposed bed of the Warm Springs reservoir, near Riverside, Malheur County, Oregon, collected by Frank S. Zimmerman of Payette, Idaho. The moss in the specimen is probably not of organic origin but is pictured here for comparison with figs. 2 and 3, which have been accepted as the result of algal growth.

Figure 2, tentatively identified as Skotophile algae, is a section of an igneous nodule, or "thunder egg," from the "Plume Bed" on the Priday Ranch, east of Antelope, Oregon, given to Mr. Hess by Mr. C. H. Robinson of Puyallup, Washington.

On figure 3 is illustrated a silicified section of a spruce log upon which may be seen growth determined as Photophile algae. Above the algae are dendritic structures of manganese oxide penetrating the rock. This specimen is from the Lake Eldorado beds, 4 miles N 20 degrees E. of Tonapah, Nevada, and was received by Mr. Hess from Mr. John L. James, Carson City, Nevada.

The preservation of vegetable matter in the form of coal, although not of too much interest to the mineralogist "purist," is of sufficient importance economically to warrant passing attention.

Ages ago nature stored up great quantities of plant remains in the earth's crust. Rich vegetation grew year after year, age after age, in marshy areas covered with shallow water. And as the trees, ferns, mosses and other plants died, they fell into the water and sank beneath its surface where they were saved from complete decay. The accumulations of vegetable matter thus formed were much thicker than the coal seams found today. In the transformation from vegetable tissue to coal, represented by the change from plants to peat, the activities of bacteria and fungi played an important part. During the course of time peat remains were buried by water-transported sand and clay, which have since solidified into the rocks now covering the hydrocarbon mineral, coal. Gradually the change from loose plant deposits to solid coal took place under the immense weight of the overlying rocks and earth movements to which they were subjected. The more deeply and the longer these masses were buried, as well as the more they were subjected to heat caused by pressure, the better the coal became, until the anthracite stage was reached.

In Northwest Branch, at Queen's Chapel airport, a locality close to Washington, D.C., many fossil trees of lignite, a form of coal, are exposed where the creek has cut through the Cretaceous

PLATE III

Fig. 1. Copper from cuprite. Globe, Gila County, Arizona. U.S.N.M. C-171.
Fig. 2. Chlorite from garnet. Spurr Mine, Michigan. U.S.N.M. 82018.
Fig. 3. Lazulite from orthoclase. Real Socavon, Potosi, Bolivia. U.S.N.M. C-4215.
Fig. 4. Gypsum from aragonite. Bastennes, Pomarez, Landes, France. U.S.N.M. R-6122.
Fig. 5. Smithsonite from calcite. Mineral Point, Wisconsin. U.S.N.M. 93772.
Fig. 6. Rutile after brookite (paramorphs). Magnet Cove, Arkansas, U.S.N.M. 45870 and R-2062.
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sands, gravels and clay. These logs are interesting in that not a few of them show galleries of prehistoric wood borers (illustrated on pl. V, fig. 1). In one specimen of the carbonized wood a larva, presumably of the wood borer, was observed, replaced by the mineral marcasite.

The replacement of a fossil by mineral matter is called petrification. Quartz, chalcedony, calcite, limonite, and pyrite are the more commonly occurring minerals found in petrifaction. However, any rock or mineral, or any mineral substance, whether of organic or inorganic nature, dug out of the ground, which had been buried beneath the surface of the earth by natural causes of geological agencies, and which bears in its form or chemical composition the evidence that it is of organic origin, is fossil. Thus, the shell of a mollusk may be preserved unchanged in both form and chemical composition. In some sediments the shells are often unchanged, even the nacreous luster being retained as in lumachelle and in certain shells found along the Miocene bluffs of Chesapeake Bay. Insects are found in amber — the fossil gum of cone-bearing trees — in which they were entrapped and covered.

In northeastern Siberia, the carcass of a mammoth was found frozen in a cliff along the Beresovka River so well preserved by its deep freeze that the hair, skin, muscular tissue, fat, blood and stomach contents of its last meal remained intact. Portions of it are on display in the National Museum in Washington. Other specimens have been discovered, the flesh of which had been so perfectly preserved that they showed evidence of having been eaten by dogs and wolves, and possibly by the natives themselves.

Remains of mammoths have been found widely distributed over North America but are most numerous in Alaska. The skeletons of some are partially silicified, though none as yet has been unearthed that approaches the Siberian specimens in perfectness of organic preservation.

Tusks of the mammoth are so plentiful in northern Siberia that for over 300 years they have been collected and sold for ivory. One from Pleistocene silt deposits of the Kolyma River, Siberia, and on exhibit in the U. S. National Museum, shows surface alteration of the ivory to vivianite.

The replacement by vivianite of organic remains is not confined to mammoth tusks however. Root-like forms of the mineral, 3 centimeters or more long, have been found 20 to 30 feet below the surface in clay excavated for government building sites along Constitution Avenue in Washington, D.C. These mineral deposits are attributed to the abundance of plants and other organic bodies existing in the area long ago, which were later converted to the ferrous phosphate, vivianite.

Belemnites (so-called fossil sea pens) and fossil clams have been found at Mullica Hill, Gloucester County, N. J., with their interiors filled with vivianite. And less than 30 years ago several specimens of crystallized vivianite were found in Clearwater County, Idaho, suggestive of the mold of a horn or tusk, but, due to lack of definite organic structure, exact opinions could not be given as to the specific character of the animal to which they belonged.

In those cases where replacement of the organic matter has taken place in petrifaction, the original substance may be entirely replaced by a mineral, thus shells, corals, bones and wood are often

PLATE IV

Fig. 1. Moss (probably non-organic) in chalcedony. Near Riverside, Malheur County, Oregon.

Fig. 2. Thunder egg (agate) with tentatively identified skotophile algae. Pridy Ranch, Oregon.

Fig. 3. Silicified spruce log section and photophile algae from which dendritic manganese oxide penetrates the limestone above. Lake Eldorado Beds, 4 mi. N. and E. of Tonapah, Nevada.

Fig. 4. Three cut stones of moss agate, selected from the National Gem Collection, showing landscapes produced by dendritic manganese oxide. Montana. These are of inorganic origin.

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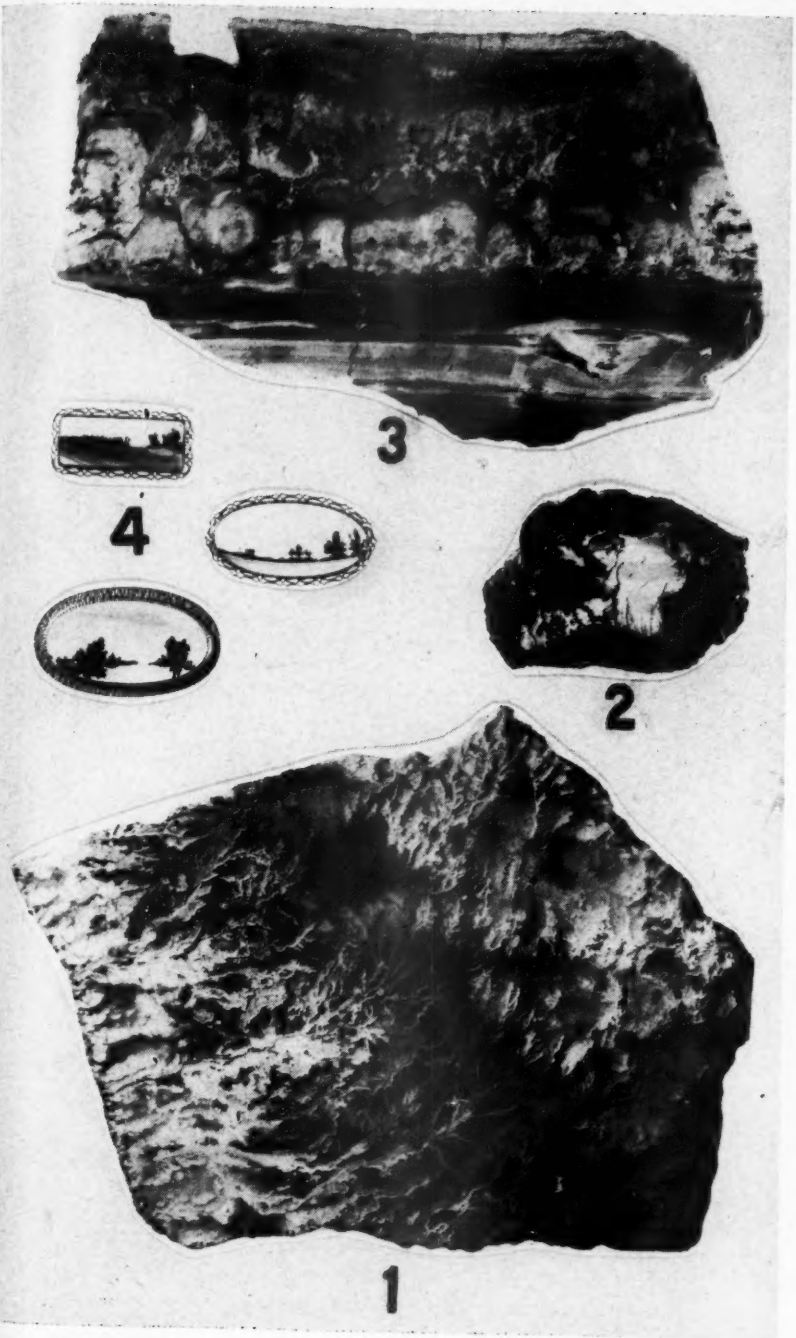
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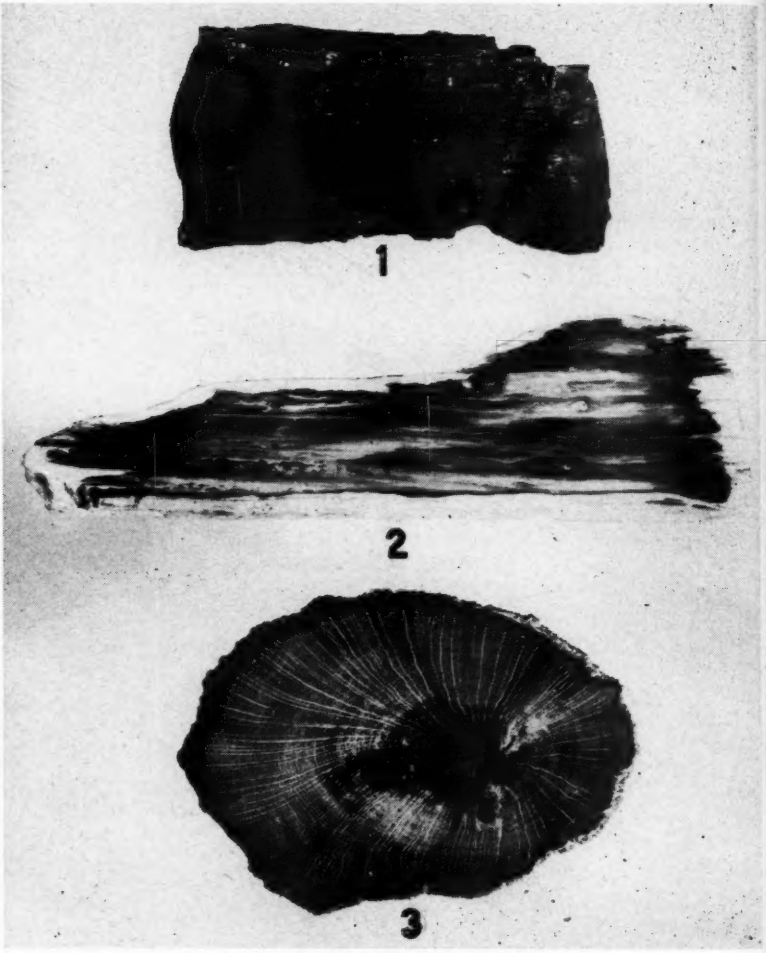

PLATE V

Fig. 1. Lignitized wood showing wood borer galleries in upper half of specimen. Queen's Chapel Airport near Washington, D. C. U.S.N.M. 97225.

Fig. 2. Silicified wood cut lengthwise to show structure preserved by petrifaction. Washington, D. C., area.

Fig. 3. Opalized wood cut crosswise to show perfection of structure through mineralization. Clover Creek, Lincoln Co., Idaho. U.S.N.M. C-38.

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found which, although bearing little external evidence of alteration, are composed entirely of silica or some other mineral. Good examples of silicified wood may be collected at the Terra Cotta clay pits, Takoma Park, D. C., and at various other localities in and around Washington. See pl. V, fig. 2.

The petrifaction of wood by silicification is brought about when alkaline water containing silica in solution is neutralized and the silica precipitated. If, when a log is buried in a bed of sand or some other medium of a siliceous nature, it becomes saturated with underground water that is alkaline, the replacement of the wood by the silica will be brought about slowly as the wood decays. As each cell of wood is oxidized, carbon dioxide will be released thus forming carbonic acid which neutralizes the alkali of the water and causes the precipitation of silica at the point where the wood is decaying. By such a process the wood may be replaced slowly, cell by cell, until the entire log is converted into silica, thus retaining much of its original structure. See pl. V, fig. 3, showing cross section of a fossil oak limb — note cellular structure.

Presently the replacement of organic remains by uraninite is of particular interest. The Museum has in its possession a mass of uraninite replacing wood and altering to schroeckingerite, weighing 52 pounds and measuring roughly 21 x 13 x 5 inches, from the celebrated deposit near Moab, Utah. Mr. George Dix, Jr., geologist working in the area, reported uraninite replacement of carbon, calcite and pyrite in fossil logs, and of uraninite replacing $CaCO^3$ of fossil fresh water gastropods. A portion of the jaw and teeth of a Triassic reptile or Tetrapod, partially replaced by uraninite, from a drift in the MiVida Mine of the famous Steen discovery, was kindly loaned to the Museum by Mrs. Charles A. Steen, for the photograph illustrated on pl. VI, fig. 4. Mr. F. L. Hess, mentioned elsewhere in this paper, furnished the cross section of a small log pictured on plate VI, fig. 5, showing the woody structure still retained by uraninite. Figure 2, plate VI illustrates a portion of a fossil plant stem cut lengthwise to reveal the preservation of its structure by silicification, and figure 3 of the same plate pictures a section of dinosaur bone retaining its internal form in chalcedony. A portion of a fossil birch limb replaced by limonite is illustrated by figure 1, plate VI.

A remarkable instance of the mineralization of organic remains by molecular replacement is that of insects preserved

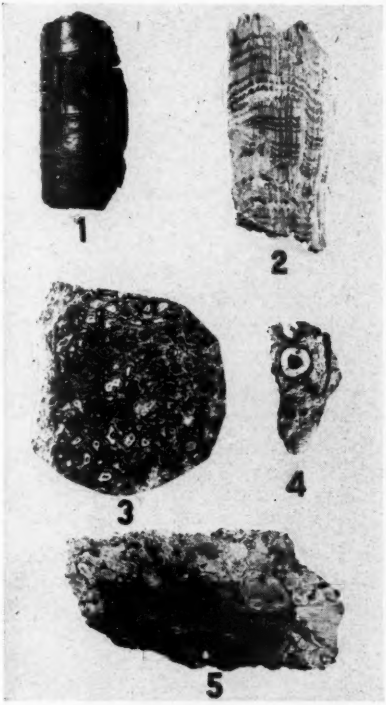

PLATE VI

Fig. 1. Section of a fossil birch limb replaced by limonite. Antwerp, New York. U.S.N.M. 44889.

Fig. 2. Fossil plant stem cut lengthwise to illustrate preservation of structure by silicification. Mojave Desert, California. U.S.N.M. 105505.

Fig. 3. Portion of a cross section of silicified dinosaur bone showing structure in chalcedony, Laramie Plains, Wyoming. U.S.N.M. 75587.

Fig. 4. Portion of jaw and teeth of a prehistoric animal (Tetrapod) impregnated with uraninite. Utah.

Fig. 5. Pitchblende (uraninite) mineralization of wood.

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in silica, probably chalcedony. These were collected by K. E. Lohman and A. M. Bassett, and were obtained from walnut-sized limestone nodules of Miocene age in the Mojave Desert, California. They were discovered in the nodules and are currently being studied by A. R. Palmer of the U. S. Geological Survey.

A semi-technical article concerning this unusual mineral replacement appeared as "Nonmarine Miocene Arthropods From California" by Palmer and Bassett in the Aug. 6, 1954 issue of *Science*.

In some instances the original substance of a fossil may be carried away in solution by underground water leaving a cavity which shows by its form that it, either wholly or in part, belonged to an organic body, or that its configuration resulted from the presence of something having an organized existence. Such objects may be properly called fossil molds and represent such organisms as leaves, fruits, wood, shells, bones, fish impressions, skin impressions, trails, footprints, and bored cavities.

Often natural casts of these molds are formed by mineral matter carried into the mold or by the infiltration of mud. The Museum possesses fine opals in the form of tree branches, shells, the vertebra section of a plesiosaur, a spruce cone, and glauberite pseudomorphs, formed when silica jell filled the cavities. Precious opal filling the fossil mold of a vertebra section of a plesiosaur, a Cretaceous swimming reptile collected in Australia, and precious opal filling a pseudomorphic glauberite mold from Australia are illustrated on plate VII, figs. 1 and 2.

Casts of dinosaur footprints are not uncommon in the Triassic sandstone near Leesburg, Virginia, an excellent example of which is on display in the Museum.

The Division of Vertebrate Paleontology boasts a unique specimen of fish cast in chalcedony (*Paleo Clupea Dakotaensis*), Oacoma, Lima County, South Dakota, pictured on pl. VIII.

Other specimens representing filled molds are depicted on plate IX. Figs. 1 and 2 are casts of echinoderms (sea urchins). The first is a specimen from Konigsberg, Germany, filled by carnelian, and the second is a sea urchin (Echinus) from Gravesend, England, cast in flint. Fig. 3 of the same plate is a mollusk shell (Lucina sp.) from near New Idria, California, changed to the calcium sulphate, selenite, and filled with mud. Fossil coral from Tampa, Florida, is figured on illustration 4 of plate IX and is cast in chalcedony. The bone fragment pictured by figure 5 of the immediate plate is probably fossil horse (Mesohippus), from the White River formation

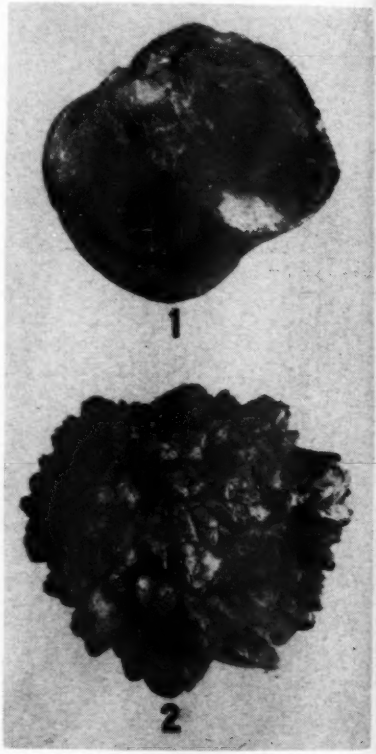

PLATE VII

Fig. 1. Vertebra of a plesiosaur (an extinct reptile of the Cretaceous Period, which ended 60 or more million years ago) cast in precious opal White Cliffs Mine, N.S.W., Australia. U.S.N.M. R-6624.

Fig. 2. Precious opal cast from mold of glauberite crystals White Cliffs Mine, N.S.W., Australia. U.S.N.M. R-76.

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(Oligocene), Badlands, South Dakota, filled also by chalcedony. Fig. 6 of plate IX is the cast of a fossil starfish (Asterias) from Birkenfeld, Germany, composed of the mineral pyrite, and below it (fig. 7) is pictured a fossil fish impression from Mansfield, Thuringia, Germany, filled with chalcopyrite.

PLATE VIII

Chalcedony cast from the mold of a fossil herring fish (Paleo Clupea Dakotaensis), Oacoma, Lima County, South Dakota.

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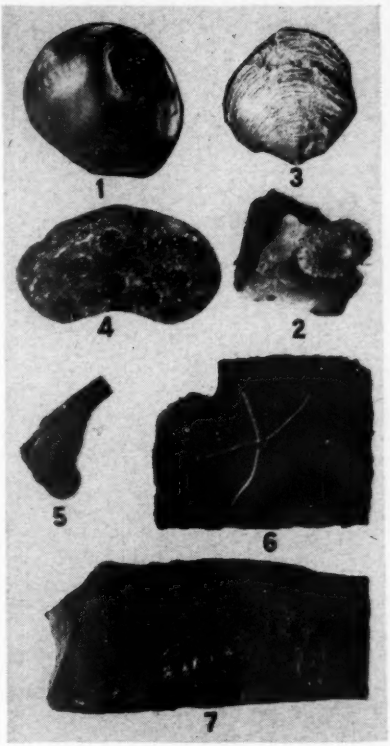

PLATE IX

Fig. 1. Fossil sea urchin (Echinus) cast in carnelian. Konigsberg, Germany. U.S.N.M. 81422.

Fig. 2. Fossil sea urchin (Echinus) cast in flint. Gravesend, England. U.S.N.M. 82465.

Fig. 3 Fossil mollusk, interior filled with mud and shell replaced by selenite. Miocene age, near New Idria, California. U.S.N.M. 62632.

Fig. 4. Fossil coral replaced by chalcedony. Tampa Bay, Florida. U.S.N.M. 45805.

Fig. 5. Fossil bone cast in chalcedony from mold, probably Mesohippus (a prehistoric horse), White River formation, Oligocene in the Bad Lands of South Dakota. U.S.N.M. 81371.

Fig. 6. Pyrite cast of a fossil starfish (Asterias), Birkenfeld, Germany. U.S.N.M. R-777.

Fig. 7. Fossil fish impression replaced by chelcopyrite, Mansfeld, Thuringia, Germany. U.S.N.M. 91645.

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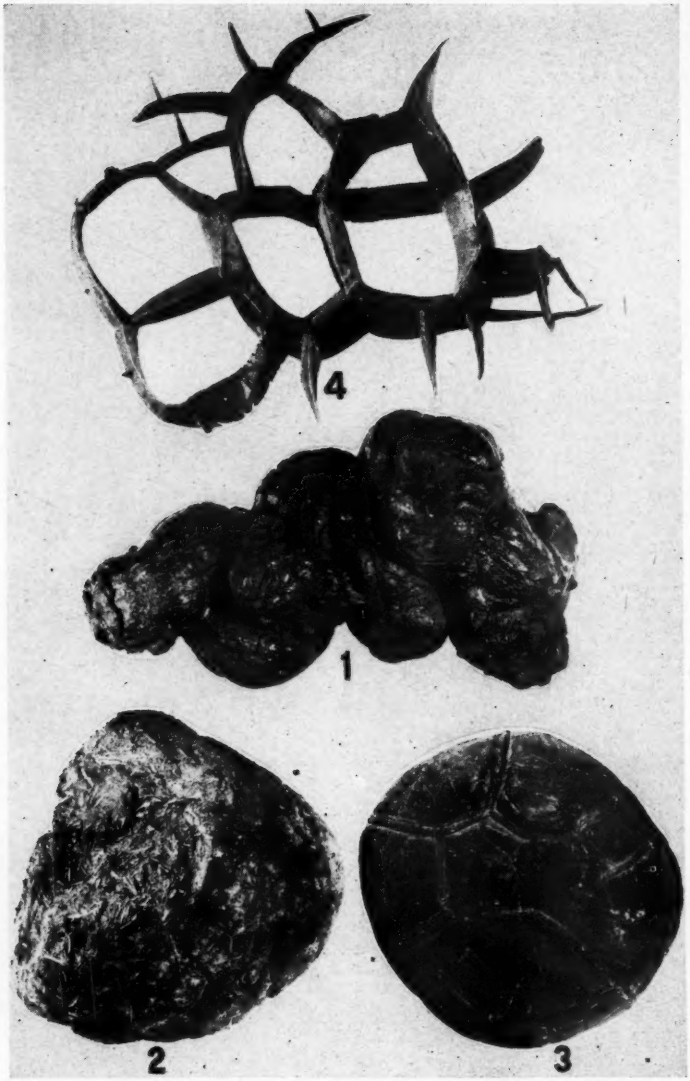

PLATE X

Fig. 1. Coprolite of an unknown prehistoric creature mineralized to siderite, a carbonate of iron, Salmon Creek, Chehalis Co., Washington. U.S.N.M. 88670.

Fig. 2. Fossil ground sloth (Nothrotherium) excrement from Rampart Cave, Arizona, showing remains of vegetable matter on which the animal fed.

Fig. 3. Septarian concretion showing the original mud cracks filled with calcite. Such forms are often mistaken for fossil turtles.

Fig. 4. Calcite filling the cracks in a septarian concretion is sometimes replaced by silica, which remains when the more soluble hardened mud between the septa is dissolved by groundwater. The remaining silica framework, due to its peculiar structure, is thus mistaken for a giant honeycomb.

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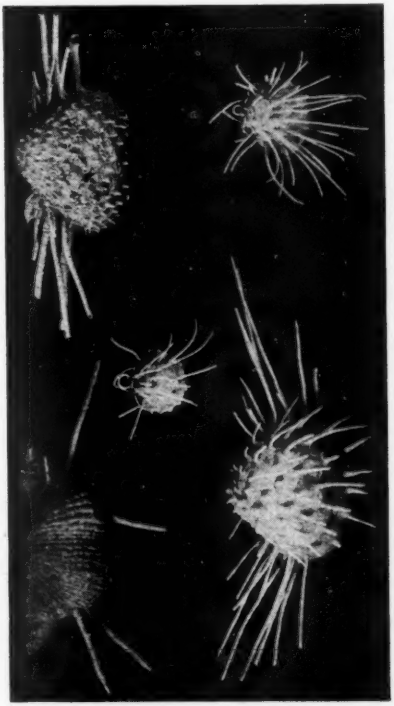
Interesting fossil material little known to the public are the coprolites, hard stony masses, consisting of the petrified fecal matter of animals, chiefly of extinct reptiles and sauroid fishes. They are found often in Coal Measures and contain, in many cases, undigested portions of the prey of the animals which have voided them, as fragments of scales, shells and bones. Coprolites thus indicate the nature of the food, and to some extent the intestinal structure of extinct animals. In some localities, as in parts of South Carolina, they are found in such quantities that the mining of phosphate rock formed by them for fertilizer constituted for many years in an important industry. Many coprolites are found which are composed of the iron carbonate, siderite (pl. X, fig. 1). Others are found in which mineralization has played little or no part in their preservation. Such are those from the "dry cave" accumulations of Rampart and Muav Caves, Arizona. Illustrated on plate X, figure 2 is a specimen of ground sloth (Nothrotherium) dung taken from Rampart Cave in which can be discerned fragments of the plants upon which the creature feasted.

The mineralization of fossils is made use of in other ways by scientists in the study of organic structures. Dr. G. Arthur Cooper of the National Museum staff has developed a method of etching silicified specimens from limestone matrix with acid, thereby disclosing features in some species of brachiopods heretofore unsuspected. Examples are illustrated on pl. XI. This modern method already throws new light upon evolutionary trends in species and gives a clearer view of the relationship of genera. Under certain conditions brachiopods, as well as other fossil forms, furnish space within their shells for the deposition of crystallized minerals, thus producing geodes. Such brachiopods are found in limestone quarries near Milwaukee, Wisconsin. The variety of crystals lining these small fossil geodes is quite astonishing and are the dream of micro-collectors. Aside from the usual calcite and quartz, crystals of sphalerite, millerite, pyrrhotite, chalcopyrite, malachite, barite, celestite, dolomite, and uncrystallized morenosite, zaratite and limonite have been observed. Halite has been found inside the Devonian brachiopod Atrypa from deep wells in Montana.

In the oil industry fossils play an essential part in the proper correlation of geological beds. It has been found that when certain classes of fossils occur in a stratum, the age of the stratum is fixed definitely and its position above or below others is determined. In some regions beds of known ages carry oil and others may be ruled out. The ages are



LEGEND TO PLATE XI

Plate XI. Exterior views of silicified spiny brachiopods obtained from Permian limestone of West Texas by solution of limestone in acid. Top left — specimen with a few long spines; top right — specimen with large spines on cardinal extremities; center — small immature specimen enlarged 4 times showing attachment ring at apex; lower left — large adult of previous shell; lower right — another immature shell, x4.

Courtesy of Dr. G. A. Cooper, U. S. National Museum.

determined by the order of the positions of the beds and by fossil evidence. Without the preserved mineralized fossils brought up in the drill cores, oil men would lose one of their important index tools.

Every year the Museum receives numerous objects, thought by the finders to be the prehistoric remains of all sorts of things. On examination many of them have proven to be false fossils or imitations produced by weathering of rocks into objects accidentally resembling footprints, snakes, shells, and so forth. False fossils made by unscrupulous persons to sell to unwary collectors are made up of various forms of dead creatures cemented to natural rock. Such a "fossil" is illustrated on plate XII, fig. 3, in the form of a dried modern frog colored to imitate rock and pasted on a slab of New York Trenton limestone.

Crystal growths have often been mistaken for plants (pl. XII, fig. 2) and concretionary forms as eggs. Casts of bivalve shells very often are regarded as fossil hearts and clinkers, and cinders have been erroneously identified as wasps or bee nests. Siliceous starfish-like animals known as blastoids are mistakenly thought to be fossil hickory nuts and iron-stained mud concretions, formed in soil around plant roots, to be peanuts.

Fossil "turtle heads," in reality the hardened sand-filled interiors of thick clam shells from which the shelly substance has been dissolved, are often sent in with great excitement. Very recently a nodular mass of silica was sent in as the petrified head of a huge monkey. Nodular chert found in a prehistoric grave has been submitted with the assumption that it was a fossil bone.

Weathered limestone boulders and silica nodules shaped by natural solution are frequently believed to be the stone casts of bones and human feet. Natural imitative forms of a bone and foot are illustrated on pl. XII, figs. 1 and 4, respectively. Mud marks on shale, a result of wave or ripple action on soft mud influenced probably by seaweed and later hardened into stone, was imagined by the finder to be a fossil snake (pl. XII, fig. 5). Figure 6 of plate 5 represents a portion of a fossil crinoid column replaced by silica and simulating a nubby ear of corn.

Septarian concretions in various stages of development are regarded by many persons as petrified turtles. In reality, the concretions are hardened mud balls, which upon drying had contracted and cracked, the cracks later being filled with calcite thus forming the partitions of the septa (pl. X, fig. 3). Often the calcite fillings are replaced by silica and underground water acting as a solvent dissolves the hardened mud of the balls leaving the less soluble silica framework representing the original mud cracks. These frameworks are occasionally mistaken for giant honeycombs. An example is pictured on plate X, fig. 4.

Near Ryegate, Vermont, on the Connecticut River, many well-preserved glacial claystone concretions have been found resembling dolls, turbans, coins, insignia and many other simulated forms. Claystone concretions resembling an insignia,

PLATE XII

Fig. 1. A peculiar form of sandstone concretions weathered to resemble a petrified bone. Tillamook, Oregon, U.S.N.M. 90266.

Fig. 2. Dendrites on milky quartz simulating plant growths.

Fig. 3. Fake fossil produced by cementing a painted mummified body of a modern frog to limestone.

Fig. 4. Concretion of chalcedony accidentally resembling a small foot enclosed in a moccasin. Mossy Creek, Jefferson Co., Tennessee. U.S.N.M. 37603.

Fig. 5. Rill mark mistakenly thought to be a small fossil snake or worm, but in reality a beach formation of geologic time.

Fig. 6. Fossil crinoid column replaced by silica and resembling a nubby ear of corn. Kankakee Co., Ill. U.S.N.M. 91146.

Figs. 7, 8, 9, 10. Glacial claystone concretions, simulating an insignia, an insect's face, a doll, and two swimming creatures, from near Ryegate, Vermont, on the Connecticut River.

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an insect face, a doll, and swimming creatures are shown on plate XII, figs, 7, 8, 9, 10. Through chemical analyses it has been established that such claystone concretions contain from 40 to 50 per cent calcium carbonate in their composition, whereas the clay beds surrounding them revealed but 2 to 3 per cent. This would seem to indicate that the original clay beds had been depleted of their lime content by groundwaters, which then deposited the carbonate around centers of attraction.

A few years ago, during the construction of a road along Good Hope Hill in the District of Columbia, large disk-like sand concretions were unearthed. Several were found measuring five feet in diameter and two feet thick with depressions at the center of their circumference. The Museum was informed that fossil wagon wheels had been uncovered!

The purpose of the preceding paper has been to present a general view as to how evidence of past life has been preserved by minerals for present investigation. Excellent publications are available on parts and phases of the subject dealt with, and the author has drawn copiously from them for facts. He is in debt, likewise, for valuable information and many suggestions received from colleagues in the department of geology and to others who were helpful in assembling scattered bits of data. Special thanks go to Drs. W. F. Foshag and G. S. Switzer for a critical reading of the manuscript; to the staff of the Smithsonian Photo Laboratory for their patient cooperation; to Dr. R. S. Bassler for assistance in plate arrangements; and to Miss Mildred E. Joseph for her secretarial work.

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The Good Earth

I have smashed my thumb and fingers,
But the urge to dig still lingers,
For by nature I am strictly lithiotic—
Tho my hands and nails may suffer,
And my hide gets rough and rougher,
There is one thing sure, I'll never be neurotic.

I have seen the lights on Broadway,
And the water front of Bombay,
With their seething mass of humans in ferment—
You can have the city's glamour,
Just give me my sack and hammer,
And I'll eat my ham and eggs and be content.

C. C. W.

ITALY AND THE RIVIERA

By COMMANDER JOHN SINKANKAS

EDITOR'S NOTE: This is the seventh of a series of articles by Commander Sinkankas about his collecting adventures while he is serving aboard a U. S. Carrier as Executive Officer. This ship, a light aircraft carrier, was enroute to the Far East where it spent considerable time and in doing so, visited many ports. We hope that you will find pleasure in reading these little episodes out of the life of a regular naval officer who follows the sea professionally but whose off-hours interest is the world of minerals.

Naples is a beautifully situated city of about one million population, set in the classic frame of the Bay of Naples. Prior to entering this expanse of water, we passed the famous volcano of Stromboli in the Lipari Islands several hours south of Naples. Stromboli was spouting a plume of white smoke from its symmetrical cone which rises abruptly for several thousand feet from the blue Mediterranean. Its green flanks are covered with farms and vineyards and even a few small towns cling precariously to its slopes. Shortly after Stromboli, the beautiful Island of Capri was passed on the starboard hand just before entering the Bay of Naples.

Capri is surrounded by extremely steep cliffs with a fair amount of soil level enough for farming on top. A close look was not possible due to the hazy atmosphere and the distance, but it is presumed that this island is composed of the same limestone which can be seen at Sorrento on the mainland, at least the character of the cliffs seems to indicate this. Capri is a noted tourist resort and also turns out a locally famous group of wines from the numerous vineyards on its slopes.

Anchoring in the Bay of Naples just off the city itself, we had an excellent view of the entire bay. Vesuvius is rather disappointing because it does not seem as high as most photos indicate, perhaps the grandeur of the total view put it in a less important place, I thought Stromboli to be far more like a volcano in shape as we think of it. Also Vesuvius is actually a cone within a cone, with the wider-mouthed base being Monte Somma, while the cone growing from its center being Vesuvius proper. There is consequently a break in the slope which represents the old crater lips of Monte Somma and it is only from certain favorable views that the classical shape of Vesuvius is at all apparent. Time did not permit examination of this famous mineral collecting locality but a tour to Pompeii and the drive from Naples to that place, showed abundant signs of the lava and ashes which snuffed out the ancient cities of Herculaneum and Pompeii. The first of those cities was covered by lava and is consequently still entombed in solid and durable rock, whereas Pompeii was laden by an enormous fall of ashes which all fell in several days, covering the city in cinders to a depth of 25 feet. This of course, has now been excavated and battered remnants of what was once a prosperous and busy seaport town of Roman days exposed to view. A large variety of volcanic rocks were noted in Pompeii, particularly a tuff, tan in color, easily quarried, and hence popular even today for walls. Harder rocks were used for pavements, corners, gutters and other details requiring greater durability. Little marble is left however, except one huge washing basin in the public bath house, the other marbles have mostly been vandalized during the ages by economy-minded descendants of the Romans. Naples itself is built on hills of tuff and toward the section of town to the West, old quarries can still be seen in the flanks.

A drive to Sorrento to the South of Naples, afforded an excellent cross-section of the rocks which were beautifully exposed along the huge and precipitous cliffs which are the basis of the justly-famed charm of this section of Italy. The road from Naples leads first through the flat lava plain above Herculaneum and Pompeii, close to the modern towns of Torre Del Greco and Castellamare. On the way, our car driver stopped at a cameo factory and nothing would do but that we had to see the famed carvers in action. We accordingly stopped at Torre Del Greco at

a large and imposing stone building housing the factory of G. Apa. As always in this part of Italy, the surroundings were beautiful and colorful. The interior of the building was handsomely appointed with a special room in which a selected group of workers were busy making cameos. Then we visited the show rooms and saw many fine items as well as a number of lesser quality things for sale to those who do not wish to pay for the best work.

The making of cameos has already been explained by many authorities and there is little point in hashing it over here, yet, there were a few points noted which may be of interest to cutters. Roughing out of designs was accomplished by rotating wheels, steel files, and steel gravers. Each workman has a small honing stone which he uses very frequently to keep all graver points sharp. Polishing the background of cameos made from shell is done with small pegs of hardwood, about two inches in length, square in cross section and tapered almost to a point. The polishing agent is pumice, collected locally. I was told by the manager that young boys of about eight years of age are apprenticed into cameo carving and eventually work into the ranks of skilled carvers. Several of these juvenile carvers were at work during our visit. I was also told that all of the cameo carvers were trained in the town of Torre Del Greco and that regardless of where in Italy you may see a cameo carver, he most likely came from the same town.

In the exhibition rooms I noted some very fine coral carvings of figurines in classic Chinese styles and asked whether they made those also. The manager assured me that they were all merely duplicates, faithfully copied, of authentic Chinese pieces. No hard stone carving is done in Italy according to my source of information, who also hastened to assure me when I mentioned the German carvers of Idar-Oberstein who do produce cameos of agate, that THEY did it all with machinery and hence there was no "art" in it. This was rather amusing in the face of the admission I had wrung out of him a few moments earlier that the coral figurines were direct copies of Chinese pieces. But, as one travels, one learns that salt is useful for seasoning more than food. It is only fair to state however, that there were some very fine pieces for sale, some by a 'Professor Noto' who did excellent work. Such pieces were not cheap by any means however, one of several inches across which took my fancy (but not my money), was priced at about $100.00. All coral was also fearfully expensive, the best grade of a very dark rich red hue and another of a uniform and delicate pink being the most highly prized.

Leaving the establishment of Mr. Apa we continued our tour across the plains until the road dipped seaward at Castellamare. Here for the space of a few miles, we drove along frowning cliffs of whitish limestone which in one locality were being quarried for cement. In a little while the road again rose until it was perched like a thin ribbon around the girth of huge limestone cliffs. Winding in and out, magnificent vista after vista was presented until we finally dipped into the tree-lined streets and shade of Sorrento. Our driver, who modestly admitted that he could speak English, promptly misunderstood our desire to dine at one of the restaurants which hang on the brink of the cliffs, thinking we wanted to "see the water" at close hand, and took us down a set of hairpin turns to a small restaurant of indifferent quality at the foot of the cliffs. We were certainly "seeing" the water a lot better from there but rather than argue the point, we settled down and dined right then and there. It was with some regret that we had to leave this charming spot but the drive back was just as beautiful and just as changing.

In Naples itself, there is little to intrigue the gem hunter and certainly nothing for the mineral collector. Naples sells many luxury items with none being cheap. Their jewelry is excellent in design and very unique, being far removed in spirit from anything we have here. They specialize in matte-finishes on gold and also in heavy jewelry with a Renaissance flavor. Cameos are for sale of course, as well as cheap jewelry made from pearl shell. Most antique stores sell mainly

ceramics and glass, with much furniture. Sometimes glass paperweights are seen, and even more rarely, some bit of authentic Oriental art.

After several enjoyable days in Naples, the ship headed for Villefranche on the French Riviera, a small town snuggled in a land-locked harbor about two miles from Nice. The beauty and climate of the Riviera are as famous as the Sorrento area of Naples, and indeed, there is a great similarity even to the limestone cliffs. For sheer magnificence, the Italian coast south of Naples carries off the prize but there are other compensations in France which more than make up for it.

All of the Riviera coast is extremely rocky and precipitous except at the mouths of rivers such as the one upon which Nice is located. Elsewhere, however, horizontal real estate is at a premium and walking anywhere can be quite a chore. Good bus service is available all along the coast and proves to be a cheap way of getting around and seeing things. From Nice for example, a bus can be taken to Monte Carlo which runs along the base of the cliffs, through tunnels hewn in rock, and always in scenery which eventually stuns one by its beauty. At Monte Carlo, another bus can be taken to return to Nice but this time via the Moyenne Corniche, or "middle cornice road", a route passing along the flanks of the coastal mountains at average elevations of about 500 feet. A still higher road, the Haute Corniche, skims along the crests of the coastal cliffs but is not serviced by any bus line and must be traveled by rented or private car.

All of the cliffs along the Riviera are sedimentary, mainly a whitish or grayish, fine-grained limestone, rather well compacted but generally showing no traces of crystallization. It is cream colored on fresh surfaces but soon weathers to white on the exterior. Caverns are known to exist in many places but most are very small except the Grotte at Monte Carlo which has several fine rooms in it. A splendid visit can be had to this cave by taking a taxi to the Jardin Exotique from the center of Monte Carlo and then descending the garden steps to the cave entrance. Like everything else here, the gardens and the cave are unique; both are literally implanted on the face of a limestone cliff, the garden filled with cactus and succulents from all over the world while the cave was originally the home of Neolithic man.

The cave entrance is a rather wide funnel-shaped affair, originally much smaller, but opened by judicious blasting to provide a stone-paved walk leading to the beginning of the descending steps and with seats, at this point, for visitors awaiting their guide. While seated in such a party, I saw one group come out led off by a perspiring female who was patently very unhappy about the whole thing. She turned out to be an American tourist and extremely angry because she had not understood one word of the French used by the guide and also because the rooms of the cave are reached by descending about four hundred steps. Going down wasn't so bad but coming up,—for a lady of leisure, was overtaxing to say the least. In spite of this discouraging news, we descended and ascended without too much difficulty, the guide gauging his progress to give second winds to those who needed one. The rooms were well-lighted, and several, though small, were handsomely decorated with stalactites and stalagmites. The process of calcite deposition was going on actively in this cave with considerable water in evidence at the lower levels. The color of the deposit was brownish, often with alternating bands of cream.

In the city of Monte Carlo which is in the unique Principality of Monaco, the main shopping street was visited and one store was noted that sold oriental objects of art at prices well above those encountered in the Far East.

After several days on the lovely Riviera, the ship left and this time headed down the coast for Spain where the next port of call was Barcelona.

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Please find $3.00 enclosed for a renewal of my subscription. Your magazine is far superior to all the other magazines that I have subscribed to, or have seen. Thanks.

Jeff Marshall
114 Claremont Place
August 2, 1954 Cranford, New Jersey

World News on Mineral Occurrences

Items on new finds are desired. Please send them in.

Abbreviations: xl—crystal xled—crystallized xline—crystalline fl—fluoresces ph—phosphoresces

ALABAMA—The following note was received from William M. Johnson, RFD 6, Knoxville, Tenn.

"The Hillabee Schist (in Alabama) carries chalcopyrite and a cupriferous pyrrhotite, mostly in small amounts. A bed near Pyriton, Clay County, Ala., was worked for copper. One was mined near Stone Hill in the southern part of Cleburne County at what was called Wood's copper mine and also at Smith's copper mine about a mile to the northwest. Much of the mining was done in the early seventies. There was a large amount of pyrite present that did not carry any copper. The ore from the decomposed vein material at the surface was hauled to Carrollton, Ga., and shipped from there to Baltimore. A large amount of ore is still piled near the openings."

ARIZONA — Martinez Lake, Yuma Co., Ariz., is a resort on the Colorado River, 37 miles north of Yuma. From the locality we have 2 specimens sent in by Earl U. Mayer, 1753 "I" St., Yuma, Ariz. One specimen is a dark brownish petrified wood with a rough, pale greenish crust; one face polished. The other is a rounded pebble of brownish petrified coral that has altered into chalcedony.

"In the Martinez Lake District, which is part of the Colorado River and 37 miles north of Yuma, Ariz., we find wide terraces and plains which are cut through by dry washes. Fossil wood is plentiful. This is evidently an ancient sea bed as it contains numerous fossils. To date we have taken from this area the following specimens: one perfect agatized brain coral 3x4 inches; several crinoid stems; 4 kinds of corals; 2 species of brachiopods; one fossil bone joint, one tooth 1x3 inches; one section of calamite stem with 2 nodes and 2 anodes."—Recent letter from Mr. Mayer.

ARKANSAS—A few months ago we received from Mrs. John McCarty, 5824 E. 12, Kansas City 3, Mo., a nice brownish-gray section of calcite stalactite from Diamond Cave, Ark. A note with the specimen reads:

"The Diamond Cave is just outside of Jasper (Newton Co.), Ark., to the south of the town. It is 4½ miles northwest of Hwy. No. 7—you have to walk about 100 yards up a steep mountain, then go down 117 steps to get into the cave. It is much larger and far lovelier than the Cave of the Winds in Colorado. It hasn't been developed like it should though. The lighting system is good, but the floors are quite slick in spots, and in one place you have to squat down and almost crawl, but it's worth the effort."

CALIFORNIA—The following letter, dated June 21, 1954, comes from Gordon ViGario, 2231 Pine St., Bakersfield, Calif. It should have been printed sooner, but was left out for lack of room.

"A few days ago we were in northern California seeing the old gold country. It certainly was a very interesting trip both from a mineralogical view and a historical view. We crossed over an old covered bridge, at Knight's Ferry, which was built many years ago. During the gold rush, I believe that there was a ferry of some sort at this location. I do know that gold mining was done there some years after the original gold find. An old mill building stood in ruin near the river (Stanislaus—?) bed.

"Several miles up the road is Columbia—a ghost mining town of great fame. During the 1850's gold was discovered there and considerable mining activities were carried on. If I am not mistaken, there at Columbia was one of the first western fire fighting units to be established. After a great fire that wiped

out most of the town, this brigade was formed. At a little museum in Columbia I saw some of the original equipment—primitive but it did the job well.

"One of the local rockhounds told me that the whole area had been completely turned over in the search for gold. Outside of the town there was a large field that had been reduced to bedrock. The bedrock was originally 20 feet below the surface. White miners turned over the area first then Chinese miners worked the field over some more. It is interesting to note that white miners had to make at least 16 dollars—one ounce of gold—a day to live, while Chinese needed only a dollar per day for rice. This rockhound told me, too, that the gold from the Columbia area supported the Union during the Civil War. This fellow, who was in charge of the local mineral museum, showed me a collection of xled gold that was valued at many thousands of dollars. Of course this collection was housed in a glass fronted safe, but nevertheless it was a beautiful sight to see.

"I did do a bit of collecting while up there. At one little mine I obtained a few specimens of pyrite xls. The small xl enclosed is from a mine about 4 miles from Columbia. About 10 miles from Columbia there is a very large glory hole at Carson Hill. There I collected some interesting pyrite xls, some nice specimens of mariposite, and a few small quartz xls. A person has to be almost half mountain goat to be able to scale the dumps. But I did my best and came back with some good material.

"One of the interesting things about pyrite from this area is that some of it is in a "pseudo--cubic" form. That is, it is partly cubic and partly pyritohedron-and-cube." I am not too well acquainted with this form. Perhaps you could help me a little on it. The enclosed larger xl is from the glory hole at Carson Hill. It too has this "pseudo-cubic" form. I hope that you will be able to examine it."

COLORADO—We are indebted to Pat Fancher, Ouray, Colo., for the following item, dated Aug. 28, 1954.

"In the Brooklyn Mine, San Juan Co., Colo., I found a strikingly beautiful combination. Pink rhodochrosite in the outer layer; metallic-yellow pyrite in the bottom layer; in between, a lustrous black sphalerite which I at first thought was enargite because of the locality. The black is in right angular bands, as if it had filled interstices of pyrite xls. The rhodochrosite is usually crystallized on mammillary massive. One piece I have shows about 80 per cent of the sphere. I heard of, but did not see, one such piece that was covered with gold xls. (The pyrite carries up to 8 ounces in gold). The same dump yielded pyrite xls—striated, slightly curved cubes. One group had a big sphalerite xl perched on top, intergrown with the pyrite xls, but obviously of later deposition."

CONNECTICUT—The following letter, dated Nov. 2, 1954, was sent in by Walter McNamara, 7 Harmony St., Danbury, Conn.

"Here are some specimens of andalusite from Connecticut. Found it myself and is the first I ever did find, or have handled in the raw and I wouldn't know how they rate as specimens; however, they're native Connecticut stuff and mebbe that's enuff! Broke it out of a quartz vein in mica schist (a few scattered xls of ilmenite and pyrite associated with it) in New Milford Litchfield Co., under the old Lover's Leap Bridge that crosses the Housatonic River about a mile south of New Milford Township. Of dozens of xls gouged out of the quartz vein, I found only three that showed xl terminations other than the squared-off rhombohedral prisms that are typified by the specimens enclosed; The specimen labeled "B"— which, incidentally, is not the best of the three, I must admit—shows one of the exceptions. Note, too, the internal structure of one of the split xls, labeled "A" and the apparent inclusion of mica parallel with the grain of the xl."

Of the specimens received one was a nice gray xl in quartz matrix—worthy to be added to any collection.

DELAWARE—Stephen Pell, a 13 yr. old collector of 1333 Riverside Drive, Wilmington 3, Del. sent in a specimen

which he found recently at Hollyoak, New Castle Co., Del.

It is a fine grained dark gray mass of mica schist with a brownish weathered surface, it resembles petrified wood so much that it could easily be taken for it—a broken end gives it away—mica schist.

FLORIDA—A letter, dated Oct. 25, 1954, comes from W. H. Hayes, 35-22nd St., Irvington 11, N. J.

"Have just returned from a trip through the South where we had a pleasant journey and attended the "54 Eastern Federation Convention in Miami, Fla. Suprisingly enough we had a field trip for collecting in that State and if not already reported I can send you an item for World News Occurrences."

A second letter from Mr. Hayes, dated Nov. 1, 1954, reads "As to the item on the find of calcite which was taken advantage of by those who went on the field trip on Wednesday, October 13th, for the World News of Mineral Occurrences, I am sending you a sample of the same. The yellow calcite crystals are formed on a matrix of what appears to be a metamorphosed coral, and the piles of refuse from the digging of several large canals near Uleta, a small locality about 10 miles from Miami, (Dade Co., Fla.) contained considerable amounts of the calcite which is of good quality for the collectors. There were larger pieces than the one sent you but none more typical in its formation. The whole mass including the calcite crystals is highly fluorescent and phosphorescent under all wave lengths. Among the most interesting forms is that of small, smooth clams which are completely calcified and are light yellow and translucent, but very few of these were found."

The sample received consisted of small golden yellow calcite xls on white metamorphosed coral—very, very nice.

Harold Post, Box 851, Lantana, Fla., sent in some interesting specimens and the following letter dated Nov. 11, 1954.

"Last Sunday I went to where I had collected some calcite and coral and found they were building a shopping center on part of the land. They had pushed aside a few heaps of dirt when they made the parking area, so I looked over some of it. I found some nice pieces of the coral and some calcite crystal groups. Also a few shell casts along with a few concretions. Just before leaving I found a couple of chunks of something very different—all covered with dirt so I chipped off a small piece. I am going to send you a few small pieces to tell me what it is. I think it is petrified palmwood. If so it is the first I ever ran across in all my travels. This is in Palm Beach County, Fla., and in Palm Beach. It began to rain about the time I found the chunks so I didn't examine it with a glass until I arrived home. I brought 2 large chunks home, one about 6x14 inches, the other 5x20 inches. Also one piece 2x9 inches which I broke in three pieces before I knew what it was. It broke just like petrified wood I had seen before from the west. The pieces have a ring to them when tapped with a hammer."

Some specimens of the "petrified wood" were received. They were grayish, rough masses and very cellular. The exterior is very rough and light gray to white in color; the interior is more compact but cellular and dark gray to dark greenish gray in color. They are all fossil wood, but calcareous.

GEORGIA—Small, red, well-formed rutile crystals occur in the branch sands behind Bruzz Bailey's store in Mize and behind New Hope Church. It is necessary to pan in order to obtain these little crystals; occasionally they may be seen in quartz fragments. These are in Stephens County, near Toccoa, Georgia. — From Georgia Mineral Newsletter, Summer 1954, p. 91 (Dr. A. S. Furcron, Editor, 425 State Capitol, Atlanta, Ga.).

IDAHO—"I am sending you a few of the mineral finds of the past summer." —Letter dated Nov. 28, 1954, from Clarence Martin, R3, Blackfoot, Idaho.

"No. 1—From a small vein approx. 2 miles east of Blackfoot, Idaho, in Bingham County. It lies near the road in an

open cut made by the Highway Department." — Brownish, waxy, crumbling masses of montmorillonite.

"No. 2 — From a large deposit lying east of Highway 28, between Gilmore and Leadore in Lemhi County, Idaho." — Earthy, grayish bentonite.

More will follow in next issue of R & M.

ILLINOIS—Last June we had some correspondence with H. E. Chelf, 219 Hendryx Lane, Peoria, Ill. In his letter, dated June 15, 1954, he wrote: —

"To keep Illinois on the map and in your column of mineral occurrences we investigated a locality in Brown County and found good cutting coral. The natives call it 'fluted rock'; it resembles a sponge somewhat and has the qualities of Petosky stone. The piece I just finished polishing is a yellow-pink color with tiny algae outlines in it. Will be wonderful for earrings and pendants."

A letter of later date informs us that the locality is 8 miles north of Mt. Sterling, Ill.— The fluted rock is found in Lower Shelby Creek, eroded from high bluffs.

INDIANA—Walter Reeves, R3 Greencastle, Ind., has sent us a clipping from the Indianapolis Star, Nov. 7, 1954 issue, relative to the new gypsum mine near Shoals, Martin Co., Ind. The clipping reads as follows:

SHOALS GYPSUM MINE
WILL BE 2d DEEPEST

SHOALS, Ind. (Spl.) — The U. S. Gypsum Company's mine in Martin County will be the second deepest of its kind in the nation, according to F. C. Appleyard, manager of U. S. Gypsum's mines, who said yesterday that the company's plans for the project east of Shoals call for one of the most modern mechanized mining operations in the country.

All of the latest safety precautions will be built in the mine and plant at Shoals, Appleyard said.

The official explained that U. S. Gypsum will use the "room and pillar" system of extracting gypsum from an eight to 15-foot vein which lies about 400 feet below the surface.

The deepest gypsum mine in the country is at Plasterco, Va., and it goes down 775 feet. It also is owned by U. S. Gypsum. Appleyard explained that that is not deep by comparison with other types of mines. He said that copper, for example, is mined to a depth of 4,000 to 5,000 feet in northern Michigan.

GYPSUM MINES, unlike coal mines, are free from explosive dusts and gasses and present no hazards in this respect.

In the Shoals mining operation, gypsum rock will be hoisted to the surface of the earth in a vertical, two-compartment shaft which will have two elevator-type "skips" operating in it—one going down empty while the other comes up loaded. Each skip has a capacity of four tons.

Once the gypsum reaches the surface, it will be crushed, then processed to make plaster lath and wallboard. These will be finished products, ready for shipment to building supply dealers who in turn will distribute them to home builders.

GYPSUM ROCK contains about 20 per cent of chemically combined water. To convert it to plaster, most of this combined water is driven off by applying heat to the finely ground rock. The resulting product is a dry powdery substance called "stucco" or "plaster of paris." If water is again added to it, it "sets" up or hardens. In fact, it actually reverts back to the original rock.

U. S. Gypsum will employ some 200 to 225 men, including about 45 miners, in Martin County. Work on sinking the mine shaft is now under way.

IOWA—Amel Priest, Peru, Iowa, sent in the following note, dated Oct. 6, 1954.

"The Cedar Valley limestone at Brandon and Littleton, Buchanan Co., Iowa, contains an occasional geode. The geodes occur in a soft, shaly, yellow rock known as the *Atrypa waterlooensis* zone. This fossil is also quite interesting, attaining a size of better than 2 inches in width. Many of the geodes are completely solid, filled with calcite. Once in a while one contains calcite xls and the really pretty ones contain drusy xls tinted a faint lavender."

KANSAS — From Boodle Lane, Box 331, Galena, Kans., we received two of the nicest minerals specimens we ever saw from this State. One consists of brassy spear-point marcasite on xled lead-gray galena and both on a base of white chert. The other is a gorgeous peacock-blue iridescent xled sphalerite. Both specimens come from the Ballard Mine, Cherokee Co., Kans.

KENTUCKY — Chas. B. Kallmeyer, 145 Division St., Bellevue, Ky., sent in a specimen of red granite containing bronzy flakes of mica (no doubt altered biotite). The mica is such a lustrous golden color that at first glance it appears to be native gold. His letter, dated Nov. 22, 1954 reads:

"While on a camping trip this past summer I picked up several stones like the sample I am sending you. I picked it up from the 12-mile Creek. This creek enters the Ohio River right above Oneonta, Ky. I judge I was about 3 miles up 12-mile Creek."

LOUISIANA—Small brownish nodules of limonite have been found in a gravel pit in Section 36 of Grant Parish, La. A nice specimen was sent us by Louis F. Rodrigue, Raceland, La.

MAINE—"Under separate cover I am sending you a specimen of molybdenite recently found in Newfield (York Co.), Me. This specimen was obtained on the property owned by Mr. Hans Bergendal, Kezar Falls, Me. It was in an area bordering the contact of a trap dike and pegmatite of the mountains, and is found in both trap and pegmatite. Mr. Bergendal discovered the first specimens of the deposit some months ago, protruding from the bare rock. Surface indications are promising. He kindly gave permission to "The Carpenters" to visit the place and collect specimens, a sample of which I am sending you, as just another mineral from Newfield, Me., adjoining the town in which I live. We, Forrest and I, have collected 16 minerals worthy of a place in one's cabinet, in that town. Among them is the mentioned molybdenite, scheelite, autunite, magnetite, scapolite, ilmenite, vesuvianite, garnet and a little sunstone. There are other commoner ones, of course, and perhaps some of interest that I have not mentioned. There's not a quarry or mine of significant proportions in the town. The above minerals were obtained or discovered during the "Ramblings of a Rockhound" (with apology to R. F. Henley). Far be it for me to suggest that these things are lying profusely scattered among the sweet fern and under old logs. Nevertheless we seldom make entirely fruitless trips. There is usually *something* for the bag when we walk and work as hard as is necessary to make a good garden, I'm just trying to say we don't expect Tilly Foster, Hall's Ridge, or even Weeks (Ham's) Quarry.

P.S. Included is a bit of powellite from same locality."—Letter dated Aug. 16, 1954, from L. W. Carpenter, M.D., Limerick, Maine.

The molybdenite consists of silvery-gray foliated masses in gray to brownish medium grained pegmatite. The powellite consists of brownish incrustations on and with molybdenite; the powellite fl. yellow under the Mineralight.

MARYLAND — Ray Garst, Rt. 1, Frederick, Md., has made a number of visits to the old abandoned Liberty copper mine, 1½ miles northwest of Libertytown, Frederick Co., Md. From this mine he sent us not long ago a nice dark bluish mass of bornite with dark gray chalcocite on limestone.

MASSACHUSETTS—Jack Kitson, 30 Briggs St., Easthampton, Mass., sent us a nice agate slice from the Mt. Tom Reservation in his State.

His letter dated Nov. 18, 1954 reads: "The agate was found in shallow top soil adjacent to some exposed basalt scoria, which contained a lot of quartz inclusion. Evidently it has weathered out from the same outcropping. Small, loose quartz xls, clear and smoky as well as amethyst xls were plentiful in the same soil and due to the same weathering process.

"The Mt. Tom Reservation is partly in Hampshire County and partly in Hamden County. It is administered by a special committee made up of county commission members from both counties."

MICHIGAN—Fine specimens of dark green aphrosiderite, loose xls and matrix specimens, occur in the iron mines at Michigamme, Marquette Co., Mich. The aphrosiderite is a pseudomorph after almandite.

MINNESOTA — A letter, dated Sept. 20, 1954, comes from Miss Gladys E. Henning, 3136 Hennepin Ave., So., Minneapolis, Minn. In it she writes:

"In Minneapolis, I have come across nice quartz (carnelian and agate) and many quite interesting and pretty conglomerates. The rocks seem to be from black through the colors to white, but the really brilliant colors are harder to find. I did find a small chipped piece that was strong black on the outside, the inside bright red-orange. But it was about ½ inch in size and slightly honeycombed in appearance, but I sure would like to find the stone it belonged to. I would apparently have to look for a black shiny rock."

MISSISSIPPI — Molluscan shells replaced by gray beidellite (a clay) occur in a railroad cut ½ mile south of Pontotoc, Pontotoc Co., Miss.

MISSOURI — Greenockite, as yellow, earthy incrustations on calcite, sphalerite and other minerals, occurs in tht lead-zinc mines at Webb City, Jasper Co., Mo.

MONTANA — Ten miles west of Helena, at Colorado Gulch in Lewis and Clark Co., Mont., ludwigite occurs abundantly. It is a black, radially fibrous mineral and is found in prospect pits dug in limestone.

NEBRASKA—A letter dated Oct. 25, 1954, comes from Mrs. Edwin P. Olson, Beresford, S. D. Part of it reads:

"The Rock and Rill Club of Southeastern South Dakota had several interesting trips this past summer. On one trip we drove to Anoka, (Boyd Co.), Nebr., about 15 miles south of Pickstown, S. D., where the Fort Randall Dam is located. We looked up Mr. Oscar Peterson at Anoka who took us a few miles from his place to the opalized wood fields. We each collected some lovely specimens and were thrilled to find opalized wood so near our home.

"I am mailing you a piece of black opalized wood from the locality (the hills outside of Anoka). There was a huge log of it sticking out of a bank in a gully, and the hills are full of pieces of it."

The specimen received was a deep black mass, somewhat cellular. Quartz grains (chiefly colorless to brownish) encrusted one surface of the wood.

NEVADA — Pleonaste, an iron-magnesia spinel, has been found in large masses in the Garfield Hills, 1½ miles southwest of Kinkead Siding which is 11 miles east of Hawthorne, Mineral Co., Nev. The pleonaste is dark green to nearly black in color and occurs in lenticular masses.

NEW HAMPSHIRE—Paul M. Tilden, Warner, N. H., sent in 3 interesting specimens from the famous Ruggles feldspar mine at Grafton, Grafton Co., N. H. One was an attractive specimen consisting of black uraninite, orange gummite and greenish autunite associated with large whitish plates of muscovite, all on flesh-colored feldspar. The autunite fl. green under the Mineralight. The other two specimens consisted of autunite, muscovite, biotite in pegmatite.

NEW JERSEY—During the past summer, the New Jersey Mineralogical Society (Plainfield, N.J.), made a number of field trips. The following items, by Mrs. Amanda Knoll, Secretary, is taken from the Sept. 1954, Bulletin of the Society:

"The Field Trip to Bernardsville, N.J., and the Logansville, N. J., Pottery was a huge success. Fifty-six attended. Some of the minerals collected at Bernardsville were various forms of calcite, grand

micro-mounts showing the hexagonal calcite, studded with cube pyrites; stilbite, natrolite, quartz, v. amethyst, chlorite and lignite in vugs.

"The Logansville Pottery clay dumps was the scene for much squishing through wet clay for clay concretions of fantastic shapes. Many bare feet were in evidence —We had fun!!

"The calcite collected at Bernardsville, N. J., fluoresces pink. The clay concretions from the Logansville Pottery, Logansville, N. J. are calcareous and take a nice polish."

NEW MEXICO — Some few months ago, Capt. George Wm. Owens, 2103 Rosemead Dr., Pasadena, Texas, sent us a very rich specimen of melanterite which he had dug from the wall of an old mine in Orogrande, Otero Co., N. Mex. The specimen is 3 x 5 inches in size and consists of various colors—white, green, yellow but chiefly white.

NEW YORK — Wilbur J. Elwell, 2 Duck St., Danbury, Conn., in his letter, dated Nov. 20, 1954, tells us:

"The feldspar quarry in the woods (Baylis) at Bedford (Westchester Co.), N. Y., is on the way out. A Major Oliver owns it now and he is building roads and using the dump as fill. A good road is now almost to the dump, now built over. Swell looking homes."

A famous locality may now be a thing of the past!

NORTH CAROLINA — Col. Orville M. Hewitt, 6 East Forest Road, Biltmore Forest, Asheville, N. C., sent us recently a large number of North Carolina minerals. Two are from the Geo. Howell mine, Mitchell County. One is a garnet, xline, pinkish (almandite) mass in contact with pegmatite consisting of large silvery muscovite plates and massive smoky quartz. The other is a white, platy mass of oligoclase.

NORTH DAKOTA — An anonymous contributor wrote us some few months ago that there is an abundance of geodes near New England, Hettinger Co., N. D. Can any reader give us some information on them?

OHIO — C. O. Gettings, 2001 Starr Ave., Toledo 5, Ohio, has another item for us. Here it is, dated Oct. 25, 1954:

"Recently I made a visit to the new waterway under the Maumee River right here in Toledo. This tunnel over twenty feet in diameter is blasted under the river 153 feet below the surface. Of interest to the mineral collector are the specimens blasted out during the operation. Celestite crystals (normal termination) one inch wide by two inches long were encountered in vugs opened. The dumps supplied specimens of calcite and sphalerite as well as celestite of the spear point variety and one new one resembling the chisel point but the edge of the chisel is at right angles to the face of the crystal. Fossils and mineral specimens prove the strata to be the same as Clay Center and Woodville, Ohio.

"A soil conservation agent brought me several pieces of petrified wood found in gravel pits of Ross County, Ohio. The wood is light brown coated and has a center of very dark brown, very compact and looks as though it would take a good polish.

"Mr. Chas. Innes of Jackson, Ohio, the conservation agent, told me that petrified wood can be found in any sand and gravel pit in Ross County."

OKLAHOMA—A very fine specimen of sharp iridescent brassy chalcopyrite xls coating xled pinkish dolomite has been donated by Boodle Lane, Box 331, Galena, Kans. The specimen comes from the Federal-Gordon mine, Picher, Ottawa Co., Okla.

OREGON—"Here is a mineral note from Oregon. Excellent natrolite xls occur in boulders from Road quarry on Cascade Head near Lincoln-Tillamock County boundary. Follow Highway 101 north from Otis Junction or south from Neskowin to summit of Cascade Head, turn west on forest road for 4 miles or to

end of gravel on road. Boulders containing crystals (up to ¾ in.) are on both sides of the road. This road is hilly and narrow and used extensively by log trucks, so drive carefully."—Letter, dated Dec. 2, 1954, from T. W. Abendroth, 616 S. Kimball St., Caldwell, Idaho.

PENNSYLVANIA—Small, single and doubly terminated quartz xls on gray sandstone, occur at the old Correale coal mine at Heckscherville, Schuykill Co., Pa. The crystals look smoky, because they are coated with minute scales of colorless white mica. One of these interesting groups was donated to R & M by Floyd R. Faux, 635 - 4th Ave., Bethlehem, Pa.

RHODE ISLAND — Large silvery-white flakes of talc have been found in Providence, Providence Co., R. I.

SOUTH CAROLINA — E. Smyth Blake, Rt. 1, Belton, S. C., sends in the following note, dated Nov. 17, 1954:

"I have been picking up rocks for many years. Have found amethysts in our back yard and pasture."

Belton is in Anderson County, in western South Carolina.

SOUTH DAKOTA—John P. Connor, Box 522, Armour, S. D., sent in not long ago, a white cellular quartz mass whose cavities were coated with drusy rock xls. He found the specimen in a gravel pit near Armour, Douglas Co., S. D.

TENNESSEE—"Under separate cover I am mailing you today a sample of material which I would like to learn something about.

"In this area, local amateurs call them "hematite geodes." When the samples are broken open, they are found to be filled with a real fine silica sand. One is liable to find sand of any of a half-dozen different colors." — Letter dated May 28, 1954, from Brother I. Leo (formerly of Christian Brothers College, Memphis, Tenn., but now of St. Mary's College, Winona, Minn.).

Three specimens were received from Brother Leo. One was dark brown, lemon-shaped; the others were light brown, ball-shaped, and all three were heavy and free from any rattling. They all appeared to be solid limonite concretions and so it was hard to believe they could be hollow. The dark brown was 1½ x 3 inches long, the others were 2½ inches in diameter. Out of curiosity one of the round concretions was cracked open—it broke nicely into two equal sections and to our amazement it was packed solid with sand! The specimen is a geode alright—dark gray hematite geode whose outside surface and inside as well is encrusted with tiny quartz grains and all coated by light brown limonite.

"Those geodes I sent you were from Williston, Tennessee; Fayette County. The town of Williston is about 40 miles northeast of Memphis."— Letter dated Aug. 21, 1954, from Brother Leo.

TEXAS—A few months ago we received an interesting hematite specimen from Mrs. Ruby Renfro, 2901 Bomar Ave., Fort Worth 3 Texas. A note with the specimen reads:

"We collected this from a cut in the road on Highway 243, about a mile east of Stone Point School, this is west of the town of Canton (in Van Zandt Co.), Texas.

The specimen is reddish-brown hematite with silvery muscovite on reddish-brown sandstone.

UTAH—Howard V. Hamilton, 115-B E. Adams St., Vandergrift, Pa., sent us recently a note on a locality he visited some months ago. This is the famous Pelican Point locality, Utah Lake, Utah Co., Utah.

The locality is famous for its fine pseudos of limonite after pyrite which are found in small to large cubes and groups. The pseudos occur in clay. Collectors have dug trenches and pits in the clay in search for specimens.

VERMONT — Wilbur J. Elwell, 2 Duck St., Danbury, Conn., sends in a note telling us that Mr. Eugene Parrot,

owner of the jasper quarry near Milton, Chittenden Co., Vt., died 3 years ago. His daughter now owns the property.

The Parrot quarry has been considered as one of the best jasper deposits in the east. It was written up by Robert Rex, in the Oct. 1947, R & M, pp. 910-911.

VIRGINIA—Nice red jasper pebbles have been found by the Editor of R & M along the banks of Four Mile Run (1 mile north of Alexandria) in Arlington Co., Va.

WASHINGTON — Mrs. L. R. Haggard, Copper Mountain, B. C., Canada, informs us that she has found a dandy black columbite xl in the pegmatite occurrence on Calispell Peak, Stevens Co., Wash.

WEST VIRGINIA—Francis Schiller, Luke, Md., has found some nice black turgite with smoky quartz xls and rock xls in Bloomery, Hampshire Co., W. Va.

WISCONSIN—Mrs. Ray F. Bowman, 218 River Park Rd., Loves Park, Ill., sent in an attractive specimen which she had collected at the Blackstone mine, Shullsburg, Lafayette Co., Wisc. It consists of colorless calcite xls, on bronzy, drusy marcasite. Tiny lead-gray galena xls and dark brown sphalente are sprinkled over the marcasite.

WYOMING — Bloodstone, consisting of small spots of red jasper in green plasma, occurs near Chugwater, Laramie Co., Wyo.

ANGOLA—"The accompanying specimens of calcite are from Porto Amboim, Angola. They respond to both short and long wave lamps with an orange fluorescence and seem to show up best under the long wave.

"Porto Amboim is an anchor port and I was only able to make one trip ashore, had I been able to go back I could have gotten some fine orange fluorescent crystal clusters of a kind similar to the one specimen enclosed here—but larger. As it was, I wasn't able to determine which of my specimens were fluorescent until I got them back to the ship.

"Porto Amboim is a real Elysium for the calcite collectors, several varieties of both massive and xled calcite being abundant in that area. Besides several thick veins of pure massive and xl-clustered calcite that outcrop for several dozen yards on the face of a hillside overlooking the harbor, there are a number of caves 4 or 5 miles up the coast from Porto Amboim where calcite xls of jumbo size occur. I was told about these caves but was unable to visit them.

"Except for the Angola calcite, the pickings were pretty slim this trip. Can't figure why I bothered to make the trip anyway—my fourth. The Belgian, French and Portuguese ports over there are worth calling at and offer a number of inducements to the tourist or shore-going seafarer, but them there English Colony ports, where most of our time is spent, are as drab and bedraggled as the proverbial thing that the cat dragged in.

"When it comes to bleak, unadulterated drabness of surroundings and habits of living you can't beat the English—not as a group, at any rate. Individually they're as nice as any others. Anyhow, no more African trips for me." — Letter dated May 24, 1954, from Walter McNamara, 7 Harmony St., Danbury, Conn. Letter held up for more information which took time, as he is a seaman in the Merchant Marine.

Among the calcites from Porto Amboim received were the following: white, cleavable; pale golden, xled; pale brownish, coarse xline; colorless cleavage, optical; and banded, pale brown mass.

CANADA — "What are the brownish bladed crystals? My wife and I found them on a high hill on glaciated pillow lava near Highway 70, southwest of Crow Lake, Ont., Canada." Letter from Ben Sarlund, Finland, Ont., Canada. The specimen is zoisite.

ENGLAND—Some months ago, when P. D. Boerner, Dept. of Works, Alice Springs, N.T., Australia, was touring the British Isles, he collected for us a light

buff, oolitic fossiliferous limestone. The specimen comes from an old quarry at Ford, Gloucestershire, England.

ITALY—Nice gray cellular masses of pumice have been found at Pompeii, Italy, (on the Gulf of Naples).

KOREA—Nice amethyst xls (scepter xls) on smoky quartz, have been found on Mt. Hakugan, Korea.

NIUE ISLAND — From this little island in the Pacific, we have 2 specimens sent us by Max Haleck, Pago Pago, Tutuila, American Samoa. One specimen is a light brown complete stalactite (calcite), 6 inches long. The other is a stalagmite (calcite). Both specimens fl. lemon-yellow under the long wave, and both were found in a cave on Niue (also known as Savage) Island.

POLAND—Large, transparent selenite xls occur in the vast gypsum deposits near Wislica, Poland.

SOUTH AFRICA—We have a massive, pale brassy yellow, gold bearing pyrite that is over 100 years old. It was donated not long ago by Fritz G. H. Carlson, 12 Beach St., Fairhaven, Mass.

A note with the specimen reads:

"This piece of pyrite came from a mine located at Johannesburg, South Africa. It really is more than a hundred years old. Seems that some long-dead uncle of a friend of mine worked as mine-boss for an English gold mining company and this uncle brought home several pieces of this and passed it out to his relatives. My friend has one more piece, larger than the one you have. The name of the gold mine has long since died with the uncle."

SPAIN—From the celebrated mercury mines at Almaden, Ciudad Real Province, Spain, we have a very nice red xline mass of cinnabar (chief ore of mercury). The specimen was sent us by Juan Montal, Plaza Sgdo., Corazon No. 1, Villafranca del Panades, Spain.

R & M attracts friendly people!

Editor R & M:

During a prolonged absence from home, my subscription to Rocks and Minerals expired. To allow a thing like that to happen is not the least little bit commendable, but even so you saw to it that I did not miss a single copy, please except my thanks.

It should go without saying that I like Rocks and Minerals. The articles with their valuable information, the different departments which are so orderly, and the letters, they almost let one know the friendly people that write them, even the advertisements, they are not only reliable, they are almost a Mineral Education as well. To us who like rocks, Rocks and Minerals supplies the feeling of having something behind us that is as solid as the rocks themselves.

As insurance that there will be no further lapse for some time to come, and to give you some basis for your faith, I include a Five year renewal.

C. W. Stoner
3940 10th St.
Des Moines 13, Iowa

Nov. 20, 1954

WASHOUGAL GEM CLUB SHOW

The third annual gem show by the Washougal Gen Club and in cooperation with the Yacolt Mineral Club, Columbia Gorge Rockhounds and the Mt. Hood Rock Club, will be held in the dinning room of the Crown Zellerbach Hotel in Camas, Washington, on the 16th and 17th of April, 1955. Admission is free.

Hours of the show will be from 10 a.m. to to p.m. on the 16th and 10 a.m. to 9 p.m. on the 17th.

There will be door prizes, interesting demonstrations and a field trip is being planned.

Exhibits from members of each of the clubs will feature a variety of displays from rough materials to finished gems and hand made jewelry, collections of minerals, artifacts, fossils, Gems of the Bible and a spectacular Iris Agate wheel, will be turning over lights to reveal all the colors of the rainbow. This large Iris agate was found in the Washington area by a member of the Washougal Gem Club.

WESTCHESTER MINERAL & GEM SOCIETY

The Westchester Mineral and Gem Society met Tuesday Jan. 11 in the County Center, White Plains, N. Y. Joe Rothstein, of the Lapidary and Gem Society of N. Y., gave a talk on mineral localities around the New York area. The talk was very interesting and illustrated with colored slides. Several members added comments of their own trips when special localities were mentioned. David Seaman, of the American Natural History Museum of New York, Seymour Schweitzer, Dr. Fred Stenbuck, president of the New York Mineral Association and Joe Stromwasser answered many questions that came up.

During the business meeting it was decided to have a course for beginners in minerology given by David Seaman. Details are being worked on as to place, time and cost.

Peg Nielson, Secretary
8 Mohican Park

PEGMATITE MINERALS OF THE UNITED STATES

DAVID M. SEAMAN

American Museum of Natural History, New York City

Part 3 — Fluorides, Carbonates, Sulfates, Arsenates, Vanadates, Tungstates and Molybdates

The minerals enumerated in this article are for the most part uncommon or rare in pegmatite. Only fluorite, calcite and siderite are at all common while wolframite and scheelite are quite rare and occur at only a few localities. Scheelite has been found as an economic mineral in a few pegmatites at Atolia, San Bernardino County, California and also in pegmatites north of the Reagan mining district, Nevada.

FLUORIDES (10)

FLUORITE, calcium fluoride is the most common fluoride mineral occurring in pegmatite. It is often associated with cassiterite, tourmaline, topaz, lepidolite, apatite, etc. It is usually present in minor amounts though it is occasionally found in some quantity. Fluorite appears to occur most frequently and in the largest amount in the rare earth type of pegmatite as at Barringer Hill, Llano County, Texas where large masses weighing up to four hundred pounds were formerly found.

Elsewhere fluorite occurs in many pegmatites throughout the United States. Purple cubes to three-quarters of an inch have been collected at Haddam and Portland, Connecticut. Red cleavage masses are found at the Gillette quarry at Haddam Neck, Connecticut. The best fluorite crystals have been found in the Gem Mines region north of Florissant, Colorado; green cubes and cubo-octahedrons to four inches in size. Green and purple octahedral crystals have been collected at Mt. Antero, Colorado; where also the first octahedral twinned crystals were found. In small purple crystals in druses in granite and pegmatite at the Redstone quarry, North Conway, New Hampshire, etc.

YTTROCERITE, a calcium fluoride with varying amounts of yttrium and cerium fluoride occurs as a rare mineral in the pegmatites of Cape Ann, Massachusetts.

FLUOCERITE, a fluoride of the cerium metals occurs in thick yellowish to reddish-brown hexagonal crystals as a rare mineral at St. Peter's Dome near Pike's Peak, El Paso County, Colorado.

CRYOLITE, a fluoride of sodium and aluminum occurs in limited quantity at St. Peter's Dome, Colorado.

PROSOPITE, a calcium fluoride with aluminum, fluorine and hydroxyl is another of the rare minerals found at St. Peter's Dome, Colorado.

PACHNOLITE, a fluoride of sodium calcium, and water occurs also at St. Peter's Dome, Colorado.

THOMSENOLITE with a similar composition to pachnolite but with crystals often resembling cubes occurs with the other rare fluorides at St. Peter's Dome, Colorado.

GEARKSUTITE, a hydrous calcium fluoride with aluminum and fluorine occurs at the cryolite locality near St. Peter's Dome, Colorado.

RALSTONITE, a hydrous sodium and magnesium with some aluminum is still another of the rare fluorides which have been found at the St. Peter's Dome, Colorado locality.

ELPASOLITE, potassium, sodium, and aluminum fluoride was found lining solution cavities in massive pachnolite in the cryolite bearing pegmatite near St. Peter's Dome, Colorado.

CARBONATES (15)

CALCITE, calcium carbonate, is the most common carbonate mineral found in pegmatites. It is a secondary mineral and is frequently among the last minerals to form and then usually as an alteration of other minerals. It occurs in small amounts in a number of pegmatites as at Conway, New Hampshire and Quincy, Massachusetts. Small rhombohedral crystals have been found with purple apatite crystals in small vugs in cleavelandite at Portland, Connecticut and small scalenohedral calcite crystals occur with siderite at the

Smith Mine, Newport, New Hampshire. Calcite occurs elsewhere at the Harding Mine, New Mexico. Botryoidal crusts of calcite are common in the pegmatite at the very crest of the School Section Hill in the Eight Mile Park area of Fremont County, Colorado.

DOLOMITE, calcium, magnesium carbonate is a very rare mineral in pegmatite but excellent crystals associated with muscovite crystals have been found at Hiddenite, Alexander County, North Carolina.

SIDERITE, iron carbonate, occurs not infrequently in pegmatite as an alteration of other iron bearing minerals. Excellent crystals occur at Crystal Peak near Florissant, Colorado and at Hiddenite, North Carolina. Massive and cleavable siderite has been noted at Newry and Rumford, Maine; Conway and North Groton, New Hampshire; and at Cape Ann, Massachusetts. Granular, massive siderite has recently been found as pseudomorphs after hurlbutite crystals at the Smith Mine, Newport, New Hampshire.

RHODOCHROSITE, manganese carbonate, occurs rarely in pegmatite but has been noted at a number of localities: Branchville and Portland, Connecticut; Center Strafford, New Hampshire; and at Poland, Rumford, Buckfield and Auburn, Maine.

CERUSSITE, lead carbonate, has been reported as an alteration product of galena at Amelia Courthouse, Virginia and as a pseudomorph after fremontite in the Meyers quarry? with lepidolite and pink feldspar near Canon City, Colorado.

BEYERITE, calcium, lead, bismuth carbonate occurs in compact masses at the Stewart mine at Pala, California. A mass of intergrown beyerite and bismutite weighing five pounds and eight inches in length was found in the Meyers Ranch body in Park County northwest of Guffey, Colorado. Beyerite has also been found intimately associated with bismutite in the School Section pegmatite and the Mica Lode pegmatites northwest of Canon City, Colorado.

BISMUTITE, bismuth carbonate in pulverent to dense and hard earthy masses or opaline crusts is an alteration product of native bismuth or bismuthinite and is often in intimate association with them. It is always a secondary mineral.

Bismutite occurs in many pegmatites of the Petaca district of Rio Arriba County, New Mexico; one mass of which was reported as weighing over one hundred pounds. It is also common in the Harding mine pegmatite of Taos County, New Mexico. From a number of localities in Colorado: Wood Gulch pegmatite in Gunnison County; Yard pegmatite and Trout Creek Pass in Chaffee County; the Meyers Ranch and Rosemont pegmatites of Park County; the Devils Hole, School Section, Mica Lode, Meyers quarry and Border Feldspar number one pegmatites of Fremont County; and the Burroughs and Bigger pegmatites of Jefferson County. Elsewhere bismutite has been found at Hale's quarry, Portland, Connecticut and recently from Mitchell Wash, Yavapai County, Arizona.

BISMUTOSPHAERITE with composition like bismutite but occurring in fibrous crusts with spheroidal surface occurs at Willimantic, Connecticut.

PARISITE, a fluocarbonate of the cerium metals has been found as rare, small crystals at the Fallon and Ballou quarries at Quincy, Massachusetts.

BASTNASITE, another fluocarbonate of the cerium metals occurs in pegmatite at St. Peter's Dome, Colorado and also two miles northeast of Jamestown in the same state. At the latter locality it is associated with cerite, fluorite, allanite and tornebohmite.

MALACHITE, green, basic cupric carbonate occurs rarely in pegmatite as an alteration product of other copper minerals. It has been noted as an alteration of chalcopyrite at the McKinney mine near Little Switzerland, North Carolina. It has also been found at the Etta mine near Keystone, South Dakota and at White Plains, New York. Malachite was found as an alteration of chalcocite at the School Section and Mica Lode pegmatites near the Royal Gorge, Colorado.

AZURITE, blue, basic cupric carbonate is rarer than malchite. It has been found

in pegmatite at White Plains, New York; and with white and pink lepidolite at the Half Dollar mine, Inyo County, California. Noted also in the Mica Lode and the School Section pegmatites of Fremont County, Colorado and recently in small crystals at the Etta mine near Keystone, South Dakota.

TENGERITE, a supposed yttrium carbonate was found as a white pulverent coating associated with gadolinite at the Barringer Hill, Llano County, Texas locality.

SCHROECKERINGITE, a hydrous uranium carbonate, has been identified at the Kinkel quarry at Bedford, New York as an alteration of other uranium minerals.

LANTHANITE, a hydrated carbonate essentially of lanthanum and cerium with small amounts of yttrium and other rare earths present, has been reported as an alteration product of allanite at the Barringer Hill pegmatite, Texas and similarly in a magnetite deposit at the Sandford mine, Moriah, Essex County, New York.

SULFATES (4)

BARITE, barium sulfate, has been reported from the Rainy Creek mining district seven miles northwest of Libby, Montana in veins resembling pegmatites.

ANGLESITE, lead sulfate has been reported with galena from the Rutherford mine near Amelia Courthouse, Virginia.

MELANTERITE, hydrous, ferrous sulfate occurs as an alteration of marcasite or pyrite. It has been found at the Palermo quarry, North Groton, New Hampshire.

PICKERINGITE, hydrous aluminum and magnesium sulfate occurs as a secondary mineral from the alteration of pyrite and other minerals. It has been noted at the Strickland quarry and Schoonmaker mine, Portland Connecticut.

ARSENATES (2)

URANOSPINITE, a calcium and uranium arsenate, has been found as a very rare mineral at Grafton, New Hampshire.

SCORODITE, a hydrous iron arsenate has been found recently as drusy crystals associated with stannite in small vugs in quartz at the Etta mine near Keystone, South Dakota. It has undoubtedly formed as an alteration of loellingite which is known to occur at this locality.

VANADATES (2)

PUCHERITE, bismuth vanadate has been found as a very rare mineral at the Pala Chief mine near Pala, San Diego County, California.

TYUYAMUNITE, a hydrous, basic vanadate of uranium and calcium has been identified from Barber's quarry, Frankford near Philadelphia, Pennsylvania. So called randite from this locality has been shown to be a mixture of beta-uranotile and tyuyamunite.

TUNGSTATES (5)

FERBERITE, essentially iron tungstate with up to twenty per cent manganese tungstate occurs in pegmatites and veins near Nederland, Boulder County, Colorado.

WOLFRAMITE, iron and manganese tungstate with less than twenty per cent iron tungstate and up to eighty per cent manganese tungstate occurs infrequently in pegmatite but is more common than either ferberite or huebnerite.

Wolframite has been found in pegmatite at Silver Hill, Washington; near Hill City, Harney Peak, and at the Etta mine near Keystone, South Dakota; also in the Reagan mining district, White Pine County, Nevada in veins resembling pegmatites; and with ferberite in Boulder County, Colorado.

HUEBNERITE, essentially manganese tungstate but with up to 20 per cent iron tungstate occurs very rarely in pegmatite but has been noted at some places in the Black Hills of South Dakota; also in quartz veins of pegmatite dikes on Blue Grouse Mountain ten miles north of Deer Park, Stevens County, Washington in association with cosalite and pyrite.

SCHEELITE, calcium tungstate, occurs in a number of pegmatites as at Silver Hill, Washington; near Hill City, South Dakota; reported from Mt. Mica at Paris, Maine; from New Mexico, and etc. Scheelite bearing pegmatites occur forty miles north of the Reagan district,

Nevada. Scheelite has been found in association with beryl at the Tungsten mines in Oreana canyon near Oreana, Nevada. Important deposits in pegmatite have been found in the Papoose mine and other claims at Atolia, San Bernardino County, California. Some of these pegmatites have yielded as much as three feet in width of practically pure massive scheelite.

POWELLITE, calcium and molybdenum tungstate occurred as a rare mineral at Barringer Hill, Texas.

MOLYBDATES (2)

WULFENITE, lead molybdate was formerly found as a rare mineral in pegmatite at Quincy, Massachusetts along with molybdenite and galena.

FERRIMOLYBDITE, hydrous ferric molybdate occurs as an alteration product of molybdenite at the beryl-molybdenite mine near Mt. Antero, Chaffee County, Colorado. It was also found at Barringer Hill near Bluffton, Llano County, Texas.

SUMMARY

Fluorite is the only common fluoride in pegmatites and it appears to be most common in the rare earth type. The carbonates, calcite and siderite, are often present as secondary minerals in pegmatite but are usually present in very small amounts. Bismutite is the only other carbonate frequently found in pegmatite and it occurs mostly in the pegmatites of New Mexico and Colorado. Malachite and azurite while common copper carbonates are rare in pegmatite and are present only as alteration products of other copper minerals. The sulfates, arsenates, and vanadates are extremely rare in pegmatite. Scheelite and wolframite are the most common tungstate minerals found. Scheelite has been the only economical tungstate mineral, where it has been mined successively at Atolia, California and north of Reagan mining district, Nevada. Molybdates are rare. Perhaps ferrimolybdite has been overlooked or has been mistaken for some secondary uranium mineral a number of times. No doubt it is more common than reported for pegmatites with molybdenite would commonly have it as an alteration product of that mineral.

Down to Earth Tales of Collecting Wanted

Editor R&M:

I am enclosing check for renewal. Would like to see more articles on N.E. localities. Suggest alternating issues stressing a section of the U.S.A.

Most of us possess a desire to collect minerals, and are limited to a few hundred square miles.

Collecting with a silver pick, in foreign lands from a U. S. Naval vessel is probably interesting, but taking up two pages off a not too large magazine, that is published once in two months is laying it on kind of thick.

How about down to earth tales of collecting, with some sort of digging tool that isn't inscribed "In God We Trust". This is meant to be constructive criticism and I can stand to see it published, how about you?

John R. Dillingham
Naples, Me.

Dec. 8, 1954

Fixture around the house!

Editor R & M:

R & M is a fixture around our house. Wonderful magazine.

Lottie M. Shipley
Gem Village
Bayfield, Colo.

Dec. 6, 1954

Won two prizes!

Editor R & M:

My son, William Weaver, age 11, recently won a first and second ribbon on his rock and mineral collection, exhibited in the hobby department at the Texas-Oklahoma Fair held in Iowa Park, Texas. Believe me, he was rather astounded and overcome with joy, as his collection is of poor specimens, I imagine. But I doubt if he would trade it for a gold mine.

Mrs. Milo N. Hunt
Box 399
Holliday, Texas

Oct. 13, 1954

QUASI-CLEAVABLE QUARTZ

By G. H. HALDÉN

270 Lewis Ave., Millbrae, Calif.

During the first week of October, 1954, I received a sample of massive, crystalline quartz, 3 x 2 x 1⅛ inches, colorless to pale milky-white, translucent to transparent, with a greasy-vitreous luster.

The sample, together with several samples of rose quartz and some large, foliaceous plates of muscovite, 6 x 3 x 1 inches, was collected by Mr. Wm. F. Klose, who is a member of a mineral study group, which meets periodically at my home.

The samples were collected during development work on a prospect apparently centered at the pegmatitic state of a large granite intrusive located approximately three miles east of the confluence of Indian Creek and Squaw Creek, and a short distance north of the latter creek, in Plumas National Forest, Plumas County, California.

All of the samples were by means of a rock-trimmer reduced to the size our group prefers for our reference and study specimens, that is about 1¾ x 1¼ inches, to fit Ward's pasteboard trays, SP25, 1⅞ x 1⅜".

The sample of nearly colorless quartz proved to be of particular interest.

Before trimming: the 3" x 2", flat, upper surface was covered with coarse striations similar to the horizontal ones usually found on, and characteristic of the prism faces of rock crystals. The lower surface, parallel to the upper one, was perfectly flat and covered with fine, closely spaced striations. The directions of the two sets of striations are at nearly right angles to each other. Part way between the two striated surfaces, there are clear indications of an approximately parallel joint-plane, showing that the material between the two striated surfaces is made up of two distinct layers, and suggesting a time interval between their respective depositions.

One of the sides, 2" x 1⅛", of the original sample was fairly smooth and formed angles of nearly 113 degrees and 67 degrees with the upper and lower striated surfaces, respectively.

After trimming: one of the resulting specimens resembles a nearly perfect rhombohedron, 1½" x 1" x1⅛". The faces measuring 1½" x 1" correspond to the striated sides described above, and are considered to be parallel to possible prism-faces. One of the 1" x 1⅛" faces is part of the 2" x 1⅛" side mentioned above and is parallel to the other 1" x 1⅛" face; these two faces consequently forming angles of 113 degrees and 67 degrees with the two striated faces and are considered to be parallel to possible negative or positive rhombohedral ("pyramidal") faces. (The normal angle over the slanting edge between rhombohedral and prism faces of a quartz crystal is 66° 52'.)

The striations on this specimen form surface-angles of nearly 45° with the edges.

The remaining two faces, each 1½" x 1⅛", are quite irregularly curved and do not form as decided angles with the striated faces as the other two faces do, but the tendency appears to be to approach 66 degrees 52' and 113 degrees 08', respectively, particularly as far as the layers adjacent to each striated face are concerned.

*"Quartz is usually conspiculously free from cleavage, but a quartz crystal heated and plunged into cold water often shows planes of separation parallel to both the ÷ and — rhombohedrons and to the prism as well."**

The quartz specimen under consideration was neither heated nor suddenly cooled; however, blasting had been done in the immediate vicinity of where it was collected, and it was also subjected to pressure in the rock-trimmer, applied more or less perpendicular to the striated surfaces; the faces formed might therefore be regarded as gliding-planes, because: *"Closely related to the cleavage*

* Textbook of Mineralogy, by E. S. Dana 4th Ed. by Wm. E. ord, P. 209, Art. 284

*direction in their connection with the cohesion of the molecules of a crystal are the gliding-planes, or directions parallel to which a slipping of the molecules may take place under the application of mechanical force, as by pressure."**

It happens that I, an amateur, have not previously encountered, or noticed, quartz specimens illustrating the described features, and thinking that the same may apply to some other amateur, I thought the subject of sufficient interest to record it.

The rose quartz specimens, neither before nor after trimming, exhibited any features of special interest, though they were collected immediately adjacent to the nearly colorless quartz described.

— — —

After writing the above, I asked Mr. Klose to secure for me additional, colorless quartz from the same locality; which he, very kindly did.

The fresh material received was broken-up with the object in view to ascertain whether or not it would be possible to duplicate the quasi-cleavages obtained on the original material.

The chunks were split along what by transmitted light looked like joint-planes, or planes of separation, or gliding-planes.

Several of the pieces, after trimming, show striations on the resulting, flat surfaces; none of which, however, are as large as the striated surfaces on the original sample, first described, though the striations are equally prominent.

While these striated surfaces are still regarded as being parallel to possible prism-faces, or as actually being abortive attempts to form such faces in the otherwise massive quartz, there appears not to be sufficient adjoining material to justify an attempt to duplicate, with my rather crude rock-trimmer, the rhombohedral planes fortuitously obtained on the original sample.

*Cf. Dana's Textbook, p. 210, Art. 286

— — —

I sent this article to Professor Pabst (University of California) for his comments; a copy of his reply follows below together with a copy of an abstract of Professor Rogers' paper dealing with the same subject.

Dear Mr. Haldén:

Enclosed I am returning your manuscript on *Quasi-cleavable Quartz.*

Others have also reported "cleavage" in quartz and we have specimens of quartz from several localities that show this feature. In 1934 Professor Rogers of Stanford University reported on an interesting occurrence of quartz in Mariposa County which showed what you call "Quasi-cleavage". I enclose a copy of the abstract of his paper.

The explanations which you offer for "quasi-cleavage" are reasonable and are similar to those that have been offered by others. Unfortunately the presumed translation gliding of quartz is not well established. Though such gliding on the unit rhombohedron planes has been reported, it was not observed in the experimental deformation of quartz by Griggs and Bell, Bulletin of the Geological Society of America, vol. 49: 1723-1746, 1938.

Since quartz is generally stated to have "no cleavage" I certainly think it is worth-while to call the attention of collectors to the possibility of finding quartz which shows such features as those that you have described. It might be worthwhile also to refer to the report by Rogers of which I enclose a copy.

A. Pabst

Unique Occurrence of Vein Quartz in Mariposa County, California
By Austin F. Rogers
(Abstract)

A prominent, nearly circular outcrop of vein quartz is found in the southwestern corner of Mariposa County, about 25 miles east of the city of Merced. It occurs in the metamorphic zone along the western edge of the Sierra Nevada batholith not far from the granite contact. The

quartz, which is so pure that it has been quarried as a source of silica, occurs in huge blocks or anhedral crystals. One of these measures over 24 feet in length.

In addition to imperfect cleavage, which is common in quartz, many of the quartz specimens at this locality show prominent parting parallel to the positive unit rhombohedron. The parting is either in one or two directions, but never in three directions, which clearly distinguishes it from cleavage.

The quartz breaks into slabs or plates which have a remarkable resemblance to feldspar. Some of the plates produced by parting are less than a millimeter in thickness.

The rhombohedral parting is probably due to polysynthetic inversion twinning and in all probality has been produced mechanically.

Proceedings of the Geological Society of America for 1934 (June 1935), p. 327

Novice Column

In the Sept.-Oct. 1953 R & M, Gordon ViGario, 2231 Pine St., Bakerfield, Calif. suggested that a Novice Column be opened for rank beginners in mineral collecting. These amateurs, who do not know one mineral from another, may submit their names to the Novice Column.

It is our hope that collectors having duplicates may donate a few specimens to one or more novices who are expected to acknowledge receipt of specimens received and to reimburse each sender for postage paid on the packages. Please print or write plainly the names and localities of all specimens sent novices, and if 2 or more minerals appear on the same specimen, identify each. Remember the novices do not know one mineral from another, so please be as helpful as you can.

The following is the 8th list of novice collectors.

Mr. and Mrs. Nolan DeLaughter, P.O. Box 1404, El Dorado, Arkansas.

Mrs. J. H. Wessel, 307 N. McLean, Elgin, Ill.

Martin L. Mundt, 4217 Winter St., Ft. Wayne 5, Ind.

Dennis Berard (10 yrs.), 64 Orange St., Athol, Mass.

Walter Roberts Jr., 60 Richland, Norwood, Mass.

Raymond Goddard (7 yrs.), Arthur Goddard (9 yrs.), 57 Carl Ave., Franklin Square, L. I., N. Y.

Peter Flusser, 81 Metropolitan Oval, New York 62, N. Y.

5th Grade, Hillcrest School, Peekskill, N. Y.

Susan Polis, Husted Ave., Peekskill, N. Y.

Jack C. Ward (10 yrs.), 1213 Park Drive, Elizabeth City, N. C.

Mrs. Stephen Andrassy, 27932 Loraine Rd., North Olmsted, Ohio.

Mrs. Esther Macmillan, 507 Austin Dr., Fairless Hills, Pa.

Nathan Muskin, 56 N. Goodwin St., Kingston, Pa.

Roy Weintraub (11 yrs.), 926 Morgan Ave., Drexel Hill, Penn.

Theresa Pezzullo, 2037 Mineral Spring Ave., N. Providence, R. I.

Onas Scandrette, Wessington Springs, S. D.

MINERAL SHOPPER'S GUIDE

Conducted by CHARLES A. THOMAS
706 Church Street, Royersford, Pa.

Advertisers are invited to send notes or samples of their products. This service is free.

Starting a new year without counting blessings is almost unthinkable. Thanks to those who wrote us in 1954. If we have helped a little, we are sincerely happy to have been of some assistance. In one or two instances, where we have failed to procure out-of-this-world specimens, the kind which "You can hardly get them no more", we are sorry. Thanks, too, for the great interest you readers have shown in this department. And, welcome to the future.

Good advice has been difficult to write, at times, in private letters to collectors and prospective new dealers. We have received some few boxes of plain rock for evaluation and possible identification. Although we are not equipped for accurate identification, we have been able to identify many items sent in by merely examining them visually. Tough ones should be sent to testing laboratories, but we just may know your specimen at a glance. Our main efforts run to evaluation of minerals for the purpose of sale or for exchange, as in one instance where a beginner wanted to know if his find was worth anything at all to other collectors. My hat is off to this fellow. Some advanced collectors still send junk for exchange.

Those who have heard this advice given to a beginner, please raise your hand; "Oh, it's not quite as good as I would take home, but don't throw it away; use it for exchange". Happily, not all exchanges are made with this idea in mind or the grumbling would be heard above the din of a hurricane. Our advice would more apt to be; Make a few good exchanges, sending only the best duplicates, but if you are going to spend quite a little money, why not use some of it to buy specimens from dealers? It isn't too difficult to spend $25.00 or over $50.00 per year on exchanges at the present rate of Parcel Post. What beautiful specimens could be bought for that amount. In a few years of spending a small portion of the amount usually spent in exchanges, a really good collection can be obtained.

We try to help new and old advertisers who send us material for examination by coinciding mention of the material with the advertisement placed by the sender. However, deadlines must be met. We must get our manuscript into the editor's hands on time. Therefor, samples come to us many times right after the 'script has been sent to Mr. Zodac with the note that the ad will appear in the next issue. So bear with us if the mention of fine materials must necessarily appear in the next issue following.

Captain George W. Owens sent in some rather beautiful slabs with a note that these are to be advertised for sale at eight for $1.50. The slabs were selected from an average of many groups ready for shipment and represent the best from many sawings. There are no butt ends and no pitted slabs which might be expected for such a low price. Many of the slabs are too pretty to cut into cabochons. One slab, about 2 x 3½ inches is of many colored jasper with plenty of bright red whirls and specks and this one slab alone would be worth the asking price of the lot. So you see, this is where we come in . . . to really tell the reader what's what and where to get it. Send a check to Capt. Geo. W. Owens, of 2103 Rosemead Dr., Pasadena, Texas, and see for yourself!

Some time ago, we intimated that it would be fun to be able to tell if the car ahead from out-of-state, contained passengers who might possibly be rockhounds. The many different emblems of societies just might not strike a spark with those not familiar with the insignia. Now a letter comes from an old friend

in Hot Springs, Arkansas, that they are having metal strips manufactured, 3x12 with the word ROCKHOUND, in white letters against a red background which can be obtained for 75 cents . . . . to be attached to the rear of your car . . . and/or the front. Watch for an ad in Rocks and Minerals Magazine for this item, to be sold by Mrs. John Roder, of Hot Springs, Arkansas, Route 4. Beautiful chalcedony coral is also offered.

Last November we took in a field trip with the Mineralogical Society of Pennsylvania to the famous old Cornog Quarry still operating in Cornog, Chester County, Pa. This quarry was once the source of some fine minerals such as blue quartz, siderite, gypsum needles, feldspar crystals with zircons (micro), titanite crystals, green micro epidote, grey zoisite in larger crystals and glistening blades, masses of bronzy pyrrhotite, rare ancylite and others. We found no showing of ancylite, the rare cerium silicate which shows a rose quartz pink in small crystals. There were plenty of deep red and pink smudges on rock, very sharp rock, which were in evidence all over the quarry. Although Cornog is an extremely interesting place to hunt specimens, it is also the most unkind to ungloved hands. New England has its rose quartz; Chester County, Pa., its blue quartz which, when selected with care, will cut and polish into lovely cabochons. Greenish quartz, with micro epidote and chlorite will also make an interesting polished stone, though the Cornog variety is not quite as green with inclusions as the Rhode Island quartz with actinolite. The red stain was identified as good American cut-finger stuff.

Mr. Glen E. Kiser, of the Douglass Tribune, Douglass, Kansas, sent us a nice batch of thumbnail sized Barite Roses, found near Salina, Kansas and Norman, Oklahoma. Mr. Kiser says that few collectors bother with the smaller sizes and try to see how big a specimen they can find. The smaller ones are very nice. Thank you, Mr. Kiser, for your love of minerals, and for shipping us this group. Salina, Kansas 'roses' are grayish-tan, while the Norman, Oklahoma variety are a dusty red. If the readers are interested, Mr. Kiser will not have to be hit over the head to make an exchange for these and other thumbnails.

Overheard in a quarry: "I sure love to hunt specimens, but I sent a check to a New York firm and received the most gorgeous Amethyst geodes and crystal groups imaginable. I never really expected such lovely material." Cross our palpitating heart, we heard just that. Just what we have been saying all along . . . in effect. Hunt 'em, by all means, buy 'em to get good stuff and dress up that drab display . . . . if you really love minerals.

If you do not want to get into stone cutting and polishing for varied good reasons, you can have that gem stone made to order and mounted, if you wish, from your own rough, by the Kane Lapidary and Supply Company, 2813 N. 16th St., Phoenix, Arizona. No one, but no one, objects to the high finish of the commercial lapidary. The Kane Lapidary is expert. We know, we have some . . .tops!

Commander Sinkankas has certainly been around the gem centers of the world. We just finished reading his article "Colombo-Outlet for Ceylon Gems", then turned a few pages. On page 532, the September-October issue of Rocks and Minerals Magazine, is an ad placed by the San Jose Rock Shop of San Jose, California. An interesting array of gem stones from India are offered, a few of which are: butterfly wing peridotite, moss chrysoprase, pink moss agate and the usual green, also moonstones and quite a few India regulars in good quality. The point is that the prices asked by this firm seem to be extremely low. We wonder if it is possible that the prices are actually higher in India? It is possible that they are .

The Smiths, noted mainly for their Geode Industries products, are offering Lake Superior type agates by the pound and ranging from one-quarter inch to three inches in diamater. Lake Superior type agates have always been much sought after . . . are not too easy to come by and polish beautifully. Many, that we have seen, show their beauty on the outside of the rough, unlike so many agates from

other localities where the outside must be ground away or the piece must be sawed to find the hidden beauty. The small ones may be tumbled or polished by hand and look very nice when polished as is without cutting. Free forms are lovely. We use them freely in the making of our deep picture frames along with Charlie Bennett's arborescent nickel which we know now is quite as attractive as the weathered roots and burls such as the one pictured on the cover of the September-October issue of Rocks and Minerals Magazine.

One day before Christmas, we found our first real honest to goodness clear diamond. More specifically, the diamond was found in an envelope which came from the Cresco Trading Company, 522 Fifth Ave., N. Y. 36, N. Y., who are importers of diamonds for industry. Batches of diamonds often contain stones that are of special interest to collectors of minerals, if not for the finished-gem collector (if gem collectors are ever finished). This firm will send a genuine diamond or diamonds from about 0.25 carat for $4.00 or larger ones from 0.50 carat at $8.00 to two carats at $60.00. The sample sent us is 0.45 with plenty of lustre. This firm's offer, makes a hard-to-get item much easier to come by, so come buy a diamond specimen from the Cresco Trading Company.

If you have ever collected minerals while standing on ice on a quarry hole or whatever, you are automatically a member of the Coldnose Rockhound Association.

Mr H. F. Bretthauer of Moorestown, N. J., is in the news again. He sent us a batch of polished cherts, jaspers and agates from the dredging deposits and gravel pits near Camden, N. J. It is surprising how many patterns show up in the interiors of such dull looking material. Fossils in agate, agate and jasper mixtures, agates and silicates with the most peculiar wavy lines and whirls in pleasing colors have been found and polished by Mr. Bretthauer. Several highly polished agates with fossil inclusions, much more contrasting in dark and light than Territella agate, have been found. We feel that we must warn collectors not to expect to visit Ward's Gravel pits and other gravel and dredge-deposit areas with the idea of coming away heavily laden with many likely specimens. Mr. Bretthauer's fine collection took a long time in the making and patient searching was the rule.

We received a package not too many weeks ago from Frank Fleener of Joliet, Illinois. The specimens are superb individual fossil casts of ferns of various types in the famous Mazon Creek type cleaved nodules. Mr. Fleener, well-known to many collectors and students, has a collection of fine minerals and fossils numbering over 2,800.

Mr. Mutschler's fine article on "The Luminescent Minerals of Franklin, New Jersey" in the September-October issue of Rocks and Minerals Magazine must have been appreciated by many fluorescence addicts. We concede that our mention of Mooreite as being fluorescent might be wrong. The specimen is still undoubtedly mislabeled or the luminescense attributed to it could have come from a specimen next to it. The specimen seen was in a miner's collection in Ogdensburg, N. J. Mistakes in identification of the complex and definite minerals of Franklin are very frequent. We have an olive-green garnet vein in pale greenish willemite which came to us some years ago and labeled GEM WILLEMITE. The fluorescence of the garnet seemed not to be due to underlying willemite, since small transparent flakes of the garnet were just as fluorescent as most of the willemite. More recently, two more specimens of the same material came into our possession, both labeled GEM WILLEMITE. Hardness tests are easy to make on both. The garnet is about 6.5 while the willemite is only 5.5.

Is Terra Ponderosa a tree, shrub, kind of potato or the name of a volcano? Neither . . . it's Barite.

We came across the above while looking up the name of the small stones used in making mosaics, thinking we would one day make a tray (it might take twenty-six days) and use up some small pieces of polishable material. There is not too much to the job unless one wants to form a design such as a bunch of flowers. We

had in mind, a simple tray, using chrysocolla, natrolite, white chalcedony, blue quartz, malachite and other opaque and semi-opaque stones. Small cube-like stones seen in mosaics and pavements are called tessarae. Ceramics suppliers sell just the thing for cementing stones. There are many methods which cannot be gone into here.

Buyers of specimens who know their way around, will tell you that some few dealers set prices for fine specimens some few feet above the shingles. Others, instead of asking $15.00 to $20.00 for, say, a Mexican beauty 3x5, will tack on a more than reasonable price. The Southern Gem and Mineral Co., El Paso, Texas, offers lovely Aurichalcite on Limonite for only $2.50 . . . $3.50 and many smaller beauties on down to 25 cents . . . 40 cents for 1x1. We have never seen Aurichalcite that was not attractive unless carelessly beat up or representative. See this firm's fine ads for other attractive specimens, gems and lapidary accessories.

There seems to be a rash of interest in quartz crystallizations and small crystals for crystal displays. Quartz specialists know well the various localities from which good quartz crystals have come. One of the favorites has been the rather perfectly doubly terminated quartz crystals aptly named Pecos "Diamonds." Pecos Minerals sent us, from Box 351, Roswell, N. M., a set of ten perfect double points of quartz which sell for $1.00 for ten. Nearly all of the five-eighth to one inch crystals have tiny quartz points protruding from various faces. One tiny double pyramid was held so loosely in the parent crystal that it came out when the gummed paper tape was removed. Now we have eleven perfect quartz points at no extra charge.

Collectors who start with thumbnail sized specimens and stick to it through the years, are to be envied. Specimens always look nice in cabinet drawers, and stay nice and clean. However, we would not part with our own larger specimens, especially the fluorescent ones. Frank Hankins has built himself a series of connected cabinets with drawers, plenty of drawer space, and is already looking for more space. Thumbnailers do not have this great problem. A small apartment need have but one or two neat cabinets with many shallow drawers. If one cannot build his own or wants to own some really neat cabinets, Ward's Scientific Establishment can supply the right thing at not too great a cost. These, of course, are built for that purpose and should be just right.

No green grass
No bees,
No birds in the trees
November.

The above poetical observation is applicable to the winter months. No grass cutting or other summer chores usually leave us time to send out a few packages of our own. Mrs. Trudy Mills, of Sunnyslope Lane, Phoenix, Arizona sent us a return pack that was tops. Sparkling Arizona, Utah and California crystals were predominate. As is our custom, we mark our temporary boxes with a star when items are of special interest or are just plain beautiful. All of Trudy's were so marked with a star and on up to four stars. Nice stuff, Trudy.

The Allen Lapidary Equipment Company, of Los Angeles, sent us sets of bracelets, pendants (necklaces) with chain in gold and silver and all of the necessary findings and cement, not to mention all of the beautifully tumbled baroques to go with them. All were baroques of the better type such as rutile in quartz, marcasite in chalcedony, blue beryl, red translucent garnet, blue tiger-eye, rose quartz, clear quartz (lovely), aventurine, bloodstone, agates and other quartz minerals. Many dealers handle the Allen equipment which is in wide use.

We wonder if that Alabama woman must go to court to get back that flying saucer she was hit with and which tore a gapping hole from roof to living-room! This reminds us to mention that on our last trip to the Moon, we found twelve inch crystals of Fayalite. A forty-pound mall was used to extract them.

THE AMATEUR LAPIDARY

Conducted by COMMANDER JOHN SINKANKAS
Certified Gemologist, American Gem Society.
1107 S. Oakcrest Road, Arlington, Va.

Amateur and professional lapidaries are cordially invited to submit contributions and so make this department of interest to all

Notes On Sphere Cutting

By Wm. J. Kane
Kane Lapidary and Supply
2813 N. 16th St., Phoenix, Ariz.

I recently purchased a late model sphere cutting machine with the idea of turning out spheres in a commercial way. I soon came to the conclusion that the closer you can come to cutting a stone spherical on the grinding wheel the quicker the machine will grind it to a true sphere.

Most of you are no doubt familiar with the process of sawing a cube and then sawing off 4 corners and then reversing the setting and sawing off 4 corners again. To speed up the sawing process I resort to my trimsaw. This is a Felker Model B-11 saw designed for tile cutting and has the big advantage of a sliding table. The stone can be held down on the table stationary by hand. The table then slides to make the cut and side waver is largely eliminated. With this saw I am able to cut off corners from numerous angles and produce what resembles a crudely facetted sphere. This naturally eliminates a considerable amount of the grinding job. Grinding a stone roughly spherical is a matter of practice and a rough grit soft bond wheel helps considerably.

The amateur cutter will do well to stick to soft gem materials for sphere cutting. A sphere of 3" diameter of agate or similar hardness is a tough job even with the best of working conditions. I recently turned out some 5 inch spheres of Utah Onyx and found there was practically no wear on the grinding wheel and no inclination for the grinding wheel to become rough and bumpy. On the other hand a 2 inch sphere of agate will cause the grinding wheel to start chattering very shortly.

Another time saving short cut that may not be strictly "Kosher" but it gets the job done in a surprising short time is to grind a sphere with 80 or 100 grit to spherical and then go direct to a drum sander with 120 or 150 grit dry sanding cloth. Follow this with 220 cloth and finish sanding with 320 cloth. It is very important to get the cloth pulled up tight on the drum to avoid a bumpy and chattering condition. If you can get the cloth on tight and smooth running the drum can be operated at 1750 RPM for an 8" drum. If excessive chatter is unavoidable however the speed should be reduced. The higher speed will make the cloth cut better and last longer.

I use two separate sets of sphere cups on my machine. One set for grinding and the other for polishing. This eliminates cleaning the cups.

Softer gem materials respond best to tin oxide. Put some oxalic acid in the mixture to polish onyx. I use optical quality hard felt about ⅛" thick for padding the sphere cups for polishing.

The harder stones such as agate, etc. will polish better with Cerium Oxide on felt.

Select stones of brilliant hues where possible to cut spheres. Rhodonite, Golden Tigereye, Malachite, Honey Onyx and Snowflake Obsidian all make outstanding additions to any collection when cut as spheres.

Lapidabrade Presents " The Art of Grinding Gems and Minerals."

Lapidabrade, Inc., Red Hill, Penn., have just released "The Art of Grinding Gems and Minerals," a handbook for the amateur and professional lapidary. This 14 page yellow covered publication covers the primary step in grinding gems, speed conversion table, trouble shooting on wheels, coolant, glazing, wheel wear, and wheel specification.

FOSSIL DEPARTMENT

RIPPLE MARKS

By Robert L. COX

228 Elk Creek Ave., Girard, Penna

While searching a local stream bed for fossils recently I found an interesting rock formation. It is what is known as ripple marks. After some work I managed to obtain a specimen large enough to show the ripple marks well. The specimen was a very interesting addition to my collection, so I thought it might interest readers of ROCKS AND MINERALS too. I have not yet seen ripple marks represented in the collections I have seen. For these reasons I am writing this little article.

It should first be noted that in this discussion I am referring to ripple marks formed in the sand *before* it hardened into rock, and not to the marks worn into rocks by water. These ripple marks are quite characteristic. They consist of a series of more or less parallel, straight to wavy ridges separated by concave troughs. You have no doubt seen the ripple marks made in the sand of a lake on a calm day. Imagine the sand turned to stone and you have a perfect picture of ripple marks in sandstone. The ripple marks in rock are sometimes somewhat less distinct due to weathering. Freshly exposed ripple marks ofen are in an excellent state of preservation.

The distance between ridges (called wave-length) varies from less than an inch to commonly six inches. However, some giant ripple marks up to 20 feet in wave-length have been recorded. There are two general types to be noted. 1) watercurrent and 2) wave. The watercurrent type have angular ridges which are steeper on one side than on the other. The wave (also called symmetrical ripple marks) have the same slope on both sides of the ridges and rather flat troughs between ridges. Occasionally two or more sets of ripple marks cross and form interference patterns.

Ripple marks were formed in the sandy bottoms of ancient creeks and lakes. Mud bottoms rarely formed or preserved ripple marks. If within a short period of time after formation the ripple marks were covered with a protective layer of sand or mud, the marks were preserved when the sand turned to sandstone. If left unprotected rough water soon destroyed them. Upon being reexposed to weathering the sandstones and sandy shales in which the marks are preserved rapidly weather. Micaceous sandstones preserve the ripple marks best.

Ripple marks are rather common in sandstones and sandy shales, but are rarely found in dolomites. Any fairly fresh exposure of sandstone or shale is a good place to look for them. Shale banks along creeks are good places, even creek beds if the water is nearly dried up. (Don't be deceived by water worn rocks!) The finding of ripple marks in high deposits of sandstone tells a story of the everchanging face of the earth.

After you find a specimen of ripple marks you are confronted with the problem of how to remove it. It is obvious that breaking off a 2x2 inch piece is useless. In order for a ripple mark specimen to be attractive it should show 3 or more well defined ridges. It is impossible to collect too large a specimen, but it is all too easy to lose the effect by collecting

too small a specimen. The specimen I have is 10 x 18 inches and shows 7 ridges running diagonally across the specimen. The utmost care should be used in obtaining the specimen. In my case the ripple marks were in a sandy shale which separated from the rest of the rock in a distinct layer. By carefully hammering chisels under the layer in several places I was able to separate the big piece. Three smaller pieces I obtained are no where near as attractive as the large one. Each occurrence of ripple marks will present its own collecting problems, but remember, the bigger the specimen the better.

When you get the specimen home it must be cleaned and displayed properly. A brush and running water will clean the mud etc. off the specimen. Then the edges should be carefully trimmed. Now the problem of how to display your specimen arises. Looking down on the surface does not show the marks to advantage, unless the specimen is outstanding. Still the specimen is too big to be picked up and viewed edgewise everytime. The solution seems to be in proper lighting. Place a shielded light low along one side of the specimen. Adjust it until the shadows of the ridges furnish the proper contrast to make the ripple marks readily visible. To really do up your specimen museum style, you could build a special case with proper illumination and dressed up with photographs of present day ripple marks in the sand of a beach. For those with limited space, how about trimming the specimen to rectangular shape, framing and hang it on the wall? Thoughtful display can make even a mediocre specimen look much better. (This goes for ANY mineral specimen.)

Finally, adding a ripple mark specimen to your collection may encourage you to hunt for other unusual formations such as mud cracks, worm burrowings, glacier marks etc. Although not minerals and not properly called fossils and not just rock specimens I put them in my collection under the heading "curiosities". Areas that are seemingly barren of mineral specimens often yield interesting "curiosities". Hunting for them sharpens the eye too. It's hard to realize how many things you can pass up because you don't "see" them. So, good luck and happy hunting!.

Reference

The Rock Book, by Carroll Lane Fenton and Mildred Adams Fenton, pp. 263-267, plate No. 37

The Best in the Field!

Editor R&M:

Enclosed please find check for $3.00 to cover renewal of Rocks & Minerals for 1955. Along with being a nut on Rocks & Minerals I am also considered a wee bit "Fractured" on books and magazines. You know the type; I buy and everybody, even my critics, thoroughly enjoy reading them. Consequently I try to keep in touch with all the various publications in the several fields in which I am interested. It is my most considered opinion that your publication, Rocks & Minerals, is by far the best investment for collectors of any in the field.

Your advertising customers should feel very gratified to have such an outlet in which to submit their materials to the public, since even the ads are set up in such a manner as to be an interesting supplement to articles rather than a cut and dried business proposition. I, like so many others no doubt, would like to see a monthly publication, even at increased rates, but after all you are probably maintaining a safety valve on our pocketbooks and at the same time contributing toward marital happiness by not giving us additional excuses to buy more specimens. Whatever you do keep Rocks & Minerals the friendly, personal magazine that it is at this time.

J. A. Oldenburg
822 E. 8th St.
P.O. Box 1696
Erie Pa.

Dec. 13, 1954

Furnishes many hours of pleasure!

Editor R & M:

Would not be without this fine publication for many times its subscription price. It has afforded me many hours of pleasure plus valuable information that I have garnered from its pages.

James Neal
27 New St.
Mount Joy, Pa.

Dec. 6, 1954

THE SAND COLLECTOR

CONDUCTED BY PETER ZODAC
PEEKSKILL, N.Y.

The following letter, dated Oct. 7, 1954, comes from the Rev. Wm. J. Frazer, Moosic, Penn.

"Under separate cover there is coming to you a box of sands from here, there, and everywhere.

"Ben J. Sterling, Jr., Burgess of Moosic, whose wife is a member of this church, has been getting these packages of sand. A couple of years ago, when I learned that his wife was vacationing in Florida, I asked her for a small sample. You know what's been happening ever since.

"Ben Sterling is now the President of the Lions Club of Moosic, and he's written to Club Presidents (or Governors) all over the world to get a POUND of Sand. (I've tried to tell him that an OUNCE would be enough).

"Apparently, also, he's written to the Servicemen to whom he sends a regular Newsletter, for Lt. James J. Young, whose address I have noted as Moosic, comes through with a sample from the Moroccan seashore spot near Casablanca."

We are deeply grateful to both the Rev. Frazer and to Mr. Sterling for their delightful interest in our Sand Department. We hope to start describing the sands received in the next issue.

River sand from Yuma Co., Ariz.

"I am sending you a bottle of sand from the Martinez Lake district which is part of the Colorado River and 37 miles north of Yuma (Yuma Co.), Ariz."—note from Earl U. Mayer, 1753 "I" St., Yuma, Ariz.

Martinez Lake is a resort on the Colorado River. The sand from the river is gray in color and medium grained. It consists chiefly of quartz (chiefly colorless, smoky, but brownish, reddish; and gray chalcedony also present). Some green epidote (part of it is gemmy), and black magnetite make up the remainder of the sand.

River sand from Sacramento, Calif.

Peter Mohlsick, 316—19th St., Sacramento, Calif., has sent in a sand sample which he collected in his city. The label reads: "Sand from the American River where it joins the Sacramento River, in Sacramento (Sacramento Co.), Calif."

This is a dark gray medium grained sand. It consists of quartz (smoky, colorless, reddish), biotite (bronzy, some almost yellow as to resemble gold), gray feldspar, and black magnetite.

Lake sand from Lake Okeechobee, Fla.

Last July, when the conductor of this department was on a trip to Florida, he had an opportunity to make a stop at Lake Okeechobee, Florida's biggest lake and the largest body of fresh water in the U. S. wholly within any one state. The lake is about 40 miles long and 28 miles wide. The stop was made on the east shore, at Canal Point in Palm Beach County. Here is a beach about 200 feet long and 100 feet wide made up of very coarse sand and pebbles. The sample collected was a coarse gray sand consisting chiefly of broken up sea shells (chiefly white, some gray) with some gray limestone. Some of the shells fl. a faint lemon-yellow under long wave lamp.

Magnetite sand from Dahlonega, Ga.

"Since boyhood, I have been intrigued by what history has to tell us of America's

first major gold camp, Dahlonega (Lumpkin Co.), Ga.

"Returning from the Miami (Fla.) Eastern Federation Convention, Mrs. Waskey and I visited at Dahlonega and elsewhere in the foothills of the Blue Ridge. There is still a little mining going on (in Dahlonega) and each year in October a Pioneer's Day is held for which the men grow beards and the women don Poke bonnets, and old relics are shown.

"It is believed that the many stampeders from Georgia to California in 1849 played an important part in the early days of the Western Diggings in that they brought practical knowledge of the building and the use of the Rocker and Long Tom.

"Not so well publicised is the claim that a loyal citizen of Dahlonega first used the expression "There's gold in them thar hills." The occasion being an impassioned appeal to stop the desertion of the Blue Ridge for the distant new fields. But most of the local diggings were deserted anyway, for the time being.

"Through the courtesy of Mr. Frey, of the Smith House, I panned some dirt (saprolite) from a side hill a half-mile out of town (Dahlonega). As far as I could see, did not raise a color of gold, but am sending you the concentrate anyway." — letter dated Oct. 28, 1954, from Mr. Frank Waskey, of Dillingham, Alaska, but who is spending the winter in Olney, Maryland.

This is a brownish black medium grained sand. It consists of black magnetite (many are nice lustrous tiny xls), brown limonite (some are tiny dark brown cubes pseudo after pyrite), smoky quartz, black lustrous biotite, and whitish muscovite. No gold could be spotted.

Dune sand from near St Anthony, Idaho

This is a fine grained dark gray sand. It consists chiefly of quartz (colorless, smoky, red agate, red chalcedony), pinkish feldspar, and black magnetite.

"From the sand dunes N.W. of St. Anthony, Fremont Co., Idaho. These dunes are moving continually and we had to walk approximately a mile from the car to reach the actual dunes." — letter dated March 26, 1954, from Miss Nora Lee Dennett, 242 S. Young, Wichita, 12, Kansas.

Cave sand from Fults Cave, Illinois

"I am enclosing a sample of sand that you might be interested in. While I am not a sand collector, and am not particularly interested in sand unless it is diamond, gold or platinum bearing, I will send you any that I run across.

"This sand is from the extreme end of Fults Cave, a small cave in the Mississippi River bluffs near Fults, Monroe Co., Ill." — letter dated Sept. 6, 1954, from Lynn Langhorst, Valmeyer, Ill.

The sample is a medium grained brown sand. It is practically all quartz deeply stained brown by limonite. A few grains of black magnetite also present.

Geode sand from Tunnelton, Ind.

"Of the thousands of geodes I have opened, this is the second one ever to contain sand. Found near Tunnelton, Ind. Tunnelton is in Lawrence Co., about 10 miles southeast of Bedford, Ind." — note dated Sept.12, 1954, from Walter Reeves, R3, Greencastle, Ind.

The sample is a brownish, medium grained sand. It consists entirely of quartz xls and all doubly terminated; they are colorless, smoky and ferruginous.

A 2nd letter dated Sept. 19, from Mr. Reeves, in answer to our query if Tunnelton got its name from a nearby tunnel, reads:

"Tunnelton consists of 2 or 3 stores, about 25 houses, a school, church, and possibly a garage built on a hillside with the B & O R.R. running along the bottom of the hill. It's in a farming community but never heard of a tunnel."

Quartz sand from Bellevue, Iowa.

From the gravel pits where agates are found, in Bellevue, Jackson Co., Iowa, we have a sand sample that was sent in by Miss Dorothy Gleiser, 1066 Griffith Road, Lake Forest, Ill.

This is a medium grained dark gray sand. It consists entirely of quartz (smoky, pale brownish, reddish chalcedony).

Quartz sand from Anoka, Nebr.

"I am mailing you a piece of black opalized wood from the hills outside of Anoka (Boyd Co.), Nebr. There was a

huge log of it sticking out of a bank in a gulley, and the hills are full of pieces of it." — letter dated Aug. 25, 1954, from Mrs. Edwin P. Olson, Box 425, Beresford, S. D.

The specimen was a deep black cellular mass, and so heavily encrusted with sand which was easily detachable, that a portion was collected. This is a fine grained gray sand, consisting almost entirely of quartz (colorless, brownish, smoky) with a tiny amount of black magnetite.

Lake sand from Hawthorne, Nev.

P. O. Drury, P. O. Box 1028, Las Vegas, Nev., sent in a sand sample bearing the following label:

"Collected from the shore of Walker Lake, at the town of Hawthorne (Mineral Co.), Nevada, on U. S. Hwy. 95. This area is the storage depot of much naval ammunition."

The sample is a coarse gray sand. It consists of quartz (colorless, smoky, brownish), feldspar (pinkish, gray), with some black magnetite and silvery muscovite.

Atomic bomb crater sand, New Mexico

"This sand comes from the first atomic bomb crater near Bingham (Socorro Co.), New Mexico. The one and only time this tightly-fenced site has been opened to public inspection was on Sept. 6, 1953. At that time I collected some sand about 75 feet northwesterly from a point directly below the bomb position. The material has been washed to free it from some admixed silt, and a few pieces larger than ¼ inch have been screened out. Most of the grains are the normal residue from weathering of various rocks in the adjacent mountains. In addition, there are a goodly number of fragments of the fused desert sand, produced by heat from the bomb. These are vesicular, glassy, light green and slightly radioactive. A copy of our writeup about the inspection trip is enclosed." — letter dated June 21, 1954, from Ford E. Wilson, 2924 Mountain Ave., El Paso, Texas.

The sample is a dark brown coarse sand. It consists chiefly of flesh-colored feldspar and smoky quartz with minor amounts of black magnetite, silvery muscovite, and lots of vesicular, glassy, light green fragments of fused desert sand.

The writeup mentioned by Mr. Wilson and which first appeared in the October 1953 GEOLOGICAL NEWS LETTER (published by the Geological Society of the Oregon Country) reads as follows:

Two of your New Mexico reporters had the unusual experience of visiting, on September 6, 1953, the site of the first atomic bomb explosion. This opportunity came through the courtesy of an invitation from the Alamogordo Chamber of Commerce, which arranged a caravan to the site. It was the first public inspection to be permitted.

We left Gallup at 4 o'clock in the morning, driving under a clear starry sky. After a breakfast stop in Belen, we reached Socorro, mile 192.0, at 8:30. We found the John Allen family at home and stopped for a brief visit. It was, of course, just another impromptu meeting of the New Mexico branch of the GSOC.

South to San Antonio, mile 201.3, and east to Bingham, mile 229.4, brought us to the caravan assembly point. We were early and so had plenty of time for lunch.

The caravan, under military escort, started at 12:20 from Bingham, going westward toward San Antonio. We were near the middle of the line of cars, which extended for more than two miles. At mile 247.5, we turned south on the Bruton Ranch road. The military reservation restricted area was reached at mile 252.3.

Traveling approximately south along a flat valley floor to mile 266.4, and then east to mile 270.2, brought us at 2:15 to the high fence which encloses the explosion area. This lies at the base of the Oscura Mountains. The gate was opened and caravan cars were parked inside. The crowd of several hundred persons had then to walk only a short distance to the center of the shallow crater. Major C. L. Jackson of Holloman Air Force Base, Alamogordo, standing on a low mound there, discussed briefly the features of the area. Cameras were much in evidence, including our own. For reference, some excellent photographs of the site were published in LIFE MAGAZINE, issue of

September 24, 1945.

Heat from the blast fused the desert soil to form a greenish vesicular glass. Many GSOC members are familiar with it, thanks to the courtesy of Dr. Allen. The glass crust originally occupied a circular area some 2400 feet in diameter. All of it, with the exception of a few small fragments, has now been removed by the government, and the area is seeded to grass.

At the crater center, we saw four shattered concrete pillars and some twisted steel, all that remains of the 100-foot steel tower which supported the bomb on that fateful morning of July 16, 1945.

Most persons of the caravan walked around the crater silently, as if in awe at being in the birthplace of the Atomic Age. Slowly, group by group, they returned to their cars and departed.

We returned to Socorro for the night, then on the next day drove to Gallup by way of Magdalena, Quemada, Springerville, and the Zuni Indian reservation.

Lake sand from Mahopac, N. Y.

Lake Mahopac is the largest lake in Putnam County, N. Y. It is a summer resort, with the little town of Mahopac almost surrounding the lake.

From the N.E. tip of Canopus Island . . the largest island in the lake . . we have a sand sample that the conductor of this department collected personally. There is no beach here; the sand was dug from the lake bed—the water is only one foot deep at the site.

The sample is a dark gray medium to coarse grained sand. It consists chiefly of black lustrous hornblende with smoky quartz (it could be called a hornblende sand as the hornblende predominates). Minor amounts of green epidote, and red garnet are also present and only a tiny amount of black magnetite which is most surprising as the lake is in a magnetite country—in fact an old magnetite mine is on the island itself. Three or four colorless zircons grains which fl. orange under the Mineralight were spotted in the sand. Canopus Island, a beautiful, heavily wooded island, belongs to Mr. Jack Palley, who is a subscriber for ROCKS AND MINERALS.

Garnet sand from near Harrison, Ohio

This is a fine grained dark red sand consisting chiefly of pink to red garnet, with some green epidote, dark brown limonite, lustrous black magnetite, brownish pyrite, colorless quartz. Supposed to contain gold but none seen in the sample sent us. Comes from Johnson's Fork Creek, near Harrison, Harrison Co., Ohio. Donated by Clyde C. Campbell, 705 Harrison Ave., Harrison, Ohio.

Glass sand from Sulphur, Okla.

This is a very fine grained gray sand consisting entirely of colorless quartz. It is known as Sicily sand and comes from south of Sulphur, Murray Co., Okla. Donated by Glen E. Kiser, Douglass, Kans.

Geode sand from Williston, Tenn.

Brother I. Leo, formerly of Christian Brothers College, Memphis, Tenn., but now of St. Mary's College, Winona, Minn., has sent in several hematite geodes filled with real fine quartz sand (one is liable to find sand of any of a half-dozen different colors).

The sample was a medium grained light brownish sand—all quartz (colorless, smoky, light brown to deep brown), and came from a hematite geode. The geode was broken open with a hammer and chisel (broke nicely in two) and the inside was so packed full of sand that the geode never rattled. An interesting fact the sand on one side was colorless or smoky while the other side was brown to deep brown. The sand is in odd sizes and does not show rounding; it came from a 2 inch diam. geode (1½ inches inside diam.).

"The geodes I sent you come from Williston, Tennessee (Fayette Co.). The town of Williston is about 40 miles northeast of Memphis. The geodes seemingly occur in the Grenada Formation of the Wilcox Group." — letter dated Aug. 21, 1954, from Brother Leo.

Calcite sand from Mayville, Wisc.

Cream colored, medium grained sand consisting entirely of cream-colored calcite. Donated by Dr. H. W. Kuhm, 4718 W. Lisbon Ave., Milwaukee 10, Wisc.

"From gravel pit at Mayville (Dodge Co.), Wisc." on label.

River Sand from near Bancroft, Canada

E. J. Talamini, 164 Chestnut St., Kearny, N. J., donated this sample. It is a medium grained, grayish-brown sand, consisting chiefly of quartz (colorless, smoky) and gray to pinkish feldspar with minor amounts of black biotite, black magnetite, silvery muscovite, and black tourmaline.

"York River sand taken at the bridge on the Hermon road, 8 miles east of Bancroft (Ontario), Canada."—on label.

Quartz Sand from Cartagena, Columbia.

"A friend of mine took a trip to Colombia recently. I asked him to pick up samples of sand if he had the chance. Enclosed is a sample of what he brought. Hope you find it interesting. I have not examined it—am not a sand collector myself—but thought of you." Letter dated Nov. 20, 1954, from Harold Poole, 315 Wadsworth Ave., Philadelphia 19, Penn.

The sample is a medium grained dark gray sand. It consists chiefly of quartz (colorless, smoky) and sea shells (white, gray, brown, red); the shells fl. a pale lemon-yellow under the long wave. Pale green epidote (some slender transparent xls) and black magnetite also present.

The city of Cartagena, in northern Colombia, stands on a sandy peninsula at the foot of a hill. No doubt the above sample comes from one of the sand banks.

Shell sand from Dubai, Oman

"I am sending you another vial of sand jarred loose from sea shells that were collected at Dubai, Trucial Oman, 8 miles southwest of Sharja (on the Persian Gulf and near the Strait of Hormuz), in Asia.

"This may represent a rather isolated dot on a world map of localities in your sand collecting program. Hope so."—letter dated Aug. 16, 1954, from Paul H. Steele, Box 935, Sacramento, Calif.

The sample is a fine grained pink and gray sand, consisting entirely of sea shells (pink, gray, brown, white) which fl. yellow under the long wave.

Beach sand from Estoril Portugal

Estoril is a resort on the Bay of Cascaes, which is often called the Riviera of Portugal. From the beach at Estoril we have a sand sample that was sent in by Glen E. Kiser, Douglass, Kans.

The sample is a fine grained brownish sand. It consists chiefly of quartz (colorless, smoky) and sea shells (brown, white); a very small amount of black magnetite also present.

Beach sand from Aberdeen, Scotland

Because of the many granite quarries around the city, Aberdeen, Scotland, is often called the "Granite City". From the beach at Aberdeen, which is on the North Sea, we have a sand sample that was sent us by Sandy Ramsay, 1015 Aikenhead Road, Kings Park, Glasgow S4, Scotland.

The sample is a reddish-gray medium grained sand. It consists chiefly of quartz (smoky, colorless, reddish) and feldspar (pinkish, gray) with minor amounts of black biotite, black magnetite, and silvery muscovite.

River sand from Matapa, So. Africa

F. C. M. Bawden, P.O. Box 1167, and Mrs. I. N. Gush, P.O. Box 1128, both of Johannesburg, South Africa, have donated 19 different South African sands which they personally collected and sent us in one box. One of the samples is from the Usutu River, Matapa Area, Swaziland, South Africa.

The sample is a brownish, fine grained sand. It consists chiefly of quartz (smoky, brownish) and brownish feldspar with a much smaller amount of black lustrous magnetite.

Beach sand from Norfolk Island, (Australia)

"Norfolk is a small island east of Australia, north of New Zealand, governed by Australia. It has an airport and many people from New Zealand spend a week or two there for their vacation. The Norfolk Island Pine comes from here. This sand sample was sent to me."—label on sand sample from Emily Bay, Norfolk Island, sent us by Miss Winifred H. Arnold, 2020 Magnolia Ave., Long Beach 6, Calif.

From this small island in the South Pacific, the sample is a medium grained cream colored sand. It consists almost entirely of sea shells (brown, white) with a little whitish coral.

Collector's Column

Conducted by A. Cal Lector

This column, designed to be a help to beginners in Mineralogy, began with the Sept.-Oct. 1948 issue. The column has not appeared for a few issues, but we hope to restore it as a regular feature. Halite or common rock salt was our last subject. This time let us discuss Hematite, the most important ore of iron and one of the first minerals a beginner will encounter.

Hematite

Hematite is truly a valuable and useful mineral. Each year millions of tons of iron ore are tranformed into steel. Our present civilization has come to depend upon steel for use in transportation, construction, manufacturing, and preservation of food.

Hematite derives its name from the ancient Greek term for blood. Thin splinters will exhibit a blood-red color when viewed in transmitted light. Hematite is a heavy mineral, has a hardness of 5½ to 6½ on Moh's scale and gives a cherry-red to indian-red streak. It is mainly a ferric oxide ((Fe_2O_3)). The common color is steel gray to dull red and bright red. It can be distinguished from similarly colored minerals by turning black and becoming magnetic after heating with a blow pipe.

Hematite may be found associated with almost every type of rock but the most common occurrences are in huge masses of sedimentary origin. Typical of these occurrences are the deposits in the Lake Superior region of Minnesota, Wisconsin and Michigan. A different type, made up of oolites or small globules and frequently replacing fossils, is found in rocks of the Clinton formation extending from east central New York to Alabama. Hematite is found in a variety of forms. It may be in red earthy masses or solid steel gray masses. When laminated, like flakes of mica, it is referred to as micaeous. Botryoidal masses with radiating structure are called kidney ore. Hematite is also found in thin tabular crystals which are sometimes arranged in rosettes or iron roses. It also occurs as the coloring matter in red soils and red sandstones. A variety called martite is believed to be a pseudomorph after magnetite.

Because of the abundance of hematite, only the localities that produce fine crystallized specimens will be listed. The finest kidney ore and some small brilliant crystals associated with quartz came from Cumberland, England. Crystals of rhombehedral habit, often iridescent or tarnished were found on the Isle of Elba. The St. Gotthard and Val Tavetsch areas of Switzerland produced the finest iron roses. Large flat plates, up to six inches across, have come from Brazil. The variety martite is found in excellent crystals near Twin Peaks, Millard Co., Utah.

Hematite should be in every collection; be sure to add some to yours soon.

LOOKING BACK TWENTY-FIVE YEARS AGO

in Rocks & Minerals March 1930, Issue

Some Minerals and Collections in the U. S. National Museum, by Dr. W. F. Foshag, pp 1-2. Some of the many fine specimens on display in the Museum were described in the article.

Millerite, by W. E. Howarth, pp. 3-5. A most interesting and valuable article that appealed to all collectors who had millerite in their collections.

Boulangerite and Associated Minerals of the Cleveland Mine, Stevens County, Washington, by Charles O. Fernquist, pp. 6-9. One of Washington's famous localities was featured in this article.

A Mineral Collecting Vacation, by Mrs. H. C. Dake, pp. 10-11. Here is an article written by a collector's wife, whose husband is now the famous Editor of the Mineralogist.

Club and Society Notes

Attention Secretaries—Please submit neat copies. Give dates and places of meetings. Check names for correct spelling.

East

Mineralogical Society of Pennsylvania October Field Trip.

After a year of negotiation, present owner, William C. Morrow, granted our field committee permission to run a society trip to the famous Leiper's quarry at Avondale, Delaware Co., Penn.

Filling in the form below, 184 members were soon busily engaged in mining activities.

Swarthmore, Pa., October 10th, 1954

In Consideration of permission by

WILLIAM C. MORROW

to visit his property, I hereby release and discharge said Company and The Mineralogical Society of Pennsylvania of and from all claims for damages of every character which may arise or result, directly or indirectly from any injury received during such visit, whether conducted by agents or employees of said Company or said Society or otherwise.

Name .....

Address .....

Witness .....

According to club geologist, Julie Reed, the Morrow quarry, presently in operation, is in granite gneiss, a pre-cambrian intrusive igneous rock subjected to metarmorphism which caused a banded appearance. The minerals are found in pegmatite veins cutting the gneiss.

Charley Owens of Philadelphia with his geiger counter was much in demand as members found uranium specimens, including autunite, uraninite, torbernite and gummite, in this quarry long known for the radioactive minerals it produced.

A small surface outcrop of tourmaline soon turned into a bonanza as a result of intensive digging by young and old. "Golden ager", Charles Priestly found a huge tourmaline crystal with Messers Czarnecki and Roth' finds running close seconds.

A member standing nearby watching her two young son's vigorous digging, remarked that she had never seen her boys dirtier, but had never seen them happier. Digging minerals is certainly a deterrent to juvenile delinquency.

Lloyd Best of Easton, lost a 3" garnet when it shattered at the last moment. David Evans of Doylestown, found a 3½" beryl crystal and Jack Schemm of Allentown, was happy with a smaller one. Other collectors found specimens of hyalite, thulite, 2" garnets and 4" feldspar crystals.

Dr. and Mrs. Lalos and family of Manchester, New Hampshire took the all time long distance record, coming down on the trip as guests of those friendly folk, Dick and Bea Hickson.

Ted Schoen of the New York Mineralogical Society, guest of the Shulmans, found the friendly atmosphere of our society exhilerating and enjoyed himself tremendously.

As usual having such a good time, we hated to leave as the setting sun signalled the end of the day.

Mineralogical Society of Pennsylvania Semi-Annual Meeting and Field Trip.

On Sunday, November 14th, 167 members of the Mineralogical Society of Pennsylvania were the guests of the Gault brothers, owners of the Keystone Trappe rock quarry, at Cornog, Penn.

The Honeybrook report of the Phoenixville quadrangle lists the country rock, a gabbroic gneiss cut by pegmatite dikes. Quarried, the rock is known commercially as trap rock. It is fine grained, but not aphinitic. Where exposed in the quarry it is light gray green, irregularly jointed and traversed by calcite veins. Recrystallized pegmatite with large masses of blue quartz is a characteristic feature together with siliceous feldspathic injections. This dike-like gabbroic injection in the Pickering Gneiss is an inclusion in the injecting quartz monozite.

The club was honored by the presence of honorary member, J. C. Showalter and his son, John.

Mr. Showalter remarked that what he liked most about the club was the fact that it is a club of families. In our hectic atomic world, where as a rule families no longer find their recreation together, it is encouraging to find a small segment of the population, a club of over 300 members practicing family recreation.

At the end of the business meeting, filled with interesting reports, Vice President Gene Belz made a motion to elect Mrs. Samuel Gordon to honorary membership. She is the widow of our beloved friend, Sam, whose book, *The Mineralogy of Pennsylvania* has just been re-published by the Philadelphia Academy of Natural Sciences at the behest of the Mineralogical Society of Pennsylvania.

M.S.P. cars and the rocks at Leiper's quarry, Avondals, Penna.
Photo by Harold Evans

Gene Belz' motion was unanimously approved and Mrs. Gordon filled with happy emotion voiced her appreciation and thanks.

Treasurer Walter Bancroft called attention to the fact that the society had only four honorary members, Mrs. Gordon, J. C. Showalter, Leland Quick and our good friend, Peter Zodac.

DECEMBER FIELD TRIP

On Sunday December 5th, the Society visited the beautiful, new, North Museum on the Franklin and Marshall College Campus at Lancaster, Penn., as guests of Curator of Minerals, Leonard J. Duersmith and his assistant, curator, Harry Ranck.

This was a fitting end to the year's activity as the North Museum is the birthplace of the Mineralogical Society of Pennsylvania.

Gerry & Will Shulman, Co-Chairmen,
Publicity Committee,
113 Huntington Terrace
Newark 8, N. J.

New York Mineralogical Club, Inc. Minutes of the Regular Meeting Oct. 20, 1954

The first meeting of the 1954 to 1955 season was held on October 20, 1954, in Room 403, Schermerhorn Hall, Columbia University, New York City.

The Cosminsky gavel wielded by the able arm of the executive Vice Pres., Mr. H. Allen Mitchell, brought the meeting to order at 8 P.M. Approximately 60 members attended.

Mr. Joe Rothstein introduced Miss Irene Fleming of the San Francisco Club who extended a cordial invitation to our club members to visit the San Francisco Convention of the Calif. Federation on July 18 and 19th.

Mr. Grahl reported new member applications.

The Field Trip committee reported no field trips under consideration.

Mr. Cosminsky kindly sent to the club members via Mr. Segeler gift specimen material, chiefly Thaumasite from the quarry at Centerville, Va. They were much appreciated and disappeared very rapidly; almost too rapidly. Two members almost came up with extra fingers. Miss Evelyn Waite also had gift specimens for the members.

The program, Summer Collecting Experiences by the members, followed and was participated by more than the usual.

The exhibit table was really brimming over, mostly with Herkimer Quartz specimens.

This year it must have either been good collecting or the club held spontaneous conventions at the Herkimer locality.

Mr. Leonard Morgan showed Quartz xls from Middleville, N. Y., in profusions from fist size to micro. Other material shown by

him was: Clay Concretions from Logansville Pottery Co. at Logansville, N. J.; Smoky Quartz from Eureka, Pa.; and a real furry Byssolite from Centerville, Va.

Mr. Joe Rothstein gathered Chiastolites at Sterling, Mass.; Asbestos and Williamsite at the Belvedere Mine, Eden Mills, Vt.; and reported a friendly reception at that locality. He also looted Fonda, N. Y., for Herkimer "diamonds," and obtained a fine doubly terminated quartz xl of good size at Outlet, Canada. At Cornwall, Pa., he obtained Pyrite specimens.

Mr. Curt G. Segeler did some serious mineralogical "diggin" for Lollingite; rough ortho xls in muscovite at Minot, Me.; Triphylite xls, large and sharp in smoky quartz; also Beryl at Claremont, N.H.; Uranophane and Autunite, rich impregnations of the latter, and several masses of Uranophane at Grafton Ctr., N. H. At So. Glastonbury, Conn., he collected Samarskite in rather large mass for Conn., also an xl fragment about 1". At Sanford, Me. he braved the poison ivy for fine xl specimens of Vesuvianite on massive Vesuvianite. At No. Groton, N. H., he collected Whitlockite and Eosphorite, ¾ xls in siderite matrix.

Neal Yedlin collected fine micro Bertrandite xl-rosettes in profusion at the Strickland Qy. near Portland, Conn. The specimen material was found in orange-red spots in the Albite in the newly blasted area at the rock cut entrance to the main pit..

Garnet Metacrysts in Piney Hollow Schist were shown by Dr. Daniel T. and Margaret K. O'Connell, gathered at Piney Hollow, Vt., where they occur plentifully. Dr. O'Connell also stated fine specimens of foliated Talc and also Magnetite xls could be easily obtained at Windham, Vt.

Mr. Ted Schoen demonstrated a gadget for showing triboluminescense, using Chlorophane collected at the Trumbull, Conn., Tungsten mine. It really worked well, producing a lovely green color.

Mr. T. Orchard Lisle also hit the Herkimer area for quartz xls and the area hit him with lumbago.

Mr. James Taylor couldn't believe this but he actually found someone who did not know that the New York Mineralogical Club existed. He was somewhere up in Maine. Mr. Taylor visited Black Mt. and Newry, obtaining Vivianite, black Tourmaline, Amblygonite, Beryl xls, and Columbite. At Mt. Kineo he obtained Indian arrow head rhyolite. At the Harvard mine, purple Apatite xls., and at the Lovejoy Pits, Pollucite.

Victor Pribil started out for Arizona on a scenery binge in September but the call of the emeralds at Little Switzerland, N. C. proved too much to resist. His assault on the dumps of the old abandoned emerald mines on Silvers Ridge proved worth the agony and produced a specimen of emerald bearing matrix "12x12" x 20" weighing approximately 100 lbs. This one was buried about five feet below the surface. Everything else he collected on this trip became as nothing compared with this lil ole emerald rock and it was brought home all in one piece.

The old and new business completed, adjournment was voted at 10:10 P.M.

Victor Pribil, Secretary
47-18 37th Street
Long Island City 1, N. Y.

Queens Mineral Society

After two months summer vacation, the Queens Mineral Society are again holding their monthly meetings and began their new year with an Exhibit in September. Many fine specimens were on display and the judges had difficulty with the final decision. Specimens were collected during the year by the members of our club and each person displaying specimens gave a short talk on various localities. Displayed neatly with labels and collector's name were specimens of clinohedrite, chondrodite, garnet andradite, columbite crystals, trihylite, blue hyalite, kyanite, blue celestite, gahnite, and many others. One of the largest finds, resting on the floor (much too big for the table, being about two ft. high) was a boulder containing many emeralds. The proud owner was Mr. V. Pribil, an ardent lapidarist.

Awards were given to the following members:

1st prize — Mr. and Mrs. F. Krpata.
2nd prize — Mr. and Mrs. C. Segeler.
3rd prize — Mr. Thomas Ronan.

In October, our speaker was the club's vice president, Mr. Krpata, who spoke of minerals collected throughout Michigan and Ohio. There were specimens of the copper district, domeykite, mohawkite, and algodonite. We just had our November meeting and it proved most interesting as the guest speaker was a well known person, Dr. Brian Mason, Curator of Minerals of the American Museum of Natural History. He held everyone's interest with beautiful slides of his trip throughout South West Africa, where he visited many mines both of minerals and diamonds. The lecture was enjoyed by all and we hope to have the pleasure of his presence again.

M. L. McKay, Secretary
111-20—106th St.,
Ozone Park, L. I., N. Y.

Keene Mineral Club
Keene, N. H.

The December meeting of the Keene Mineral Club was held at the home of Mr. and Mrs. J. Cummings Dort.

Project for the evening was the decoration of a Christmas tree with an assortment of flashy minerals. Each member contributing one or more specimens. Some were mounted on a styrofoam wreath while others were mobiles on wires. Many cabochons were displayed on styrofoam cut into the shape of stars and snowflakes. Metallic paper cut into the form

of trees and balls served as backing for numerous other specimens. One feature was a group of Herkimer "diamonds" made into a glistening star. At the base of the tree a group of larger specimens.

Later the tree was taken to the Thayer Public Library for display during the holiday season.

At the January meeting Dean Dwight H. Carle, of the Keene Teachers College, will demonstrate and talk on uses of the geiger counter.

Mrs. Julian Wetherbee
22 Wheelock St.
Keene, N. H.

Rockland County Mineral and Gem Society
Spring Valley, N. Y.

Dr. Frank Press of Lamont Geological Observatory, Palisades, N. Y., entertained the Rockland County Mineral & Gem Society at the Observatory on Wednesday, November 17, 1954.

Dr. Press gave an explanation of the work and research being done on the coring of the oceans bottom which constitutes approximately 80% of the Earth's surface, which up to the present time has remained a mystery, because of the simple fact that man has not had the equipment necessary to unravel the mystery of the ocean depths. It is now possible to photograph the ocean bottom at a depth of 3000 fathoms showing the rills in the surface, this being evident of movement and currents. Most of the electronic devices have been developed at Lamont.

Dr. Frank Press is a specialist on seismology, and so he spoke at first hand on the developments which have recently taken place because of the improvement on the seismograph of long period. He gave an illustrated explanation by slides that seismology was used to obtain information relative to the Earth's core and other very important data outside of the common knowledge that seismology was only to record earthquakes.

After the lecture, the group were shown some of the work in action; such as charts being logged by the seismograph. Mr. Ericson, in charge of analysis of sediments took over and showed some of the cores which have been analyzed. The sediment and silt is a help to show the age of the earth. The study of these sediments also show where vast earthquake movements have occurred millions of years ago the date of these movements can also be told by the study of carbon 14 in the sediments. For the Rockland County Rockhounds this was of great interest to know that the silt of the ocean is the embryo of the land and rock we live on and exist by, and that this important work is being developed in Rockland County, N. Y.

Marguerite R. Collyer
West Nyack, N. Y.

New Jersey Mineralogical Society, Inc.
Plainfield, New Jersey

We meet at the Plainfield Public Library, Plainfield, N. J. the first Tuesday of each month from September to May.

Our June Field Trip lead by Alexander Knoll, Chairman of the Field Trip Committee, was to the McAfee Limestone Quarry, McAfee, N. J. We collected pink apatite xls, tremolite xls, fluorite and zircon.

In July a group, led by Neil A. Wintringham, made a field trip to the Oxford area. Maine. Many fine specimens were collected and we enjoyed the hospitality of the Oxford County Mineral and Gem Society.

Our August field trip was to the Somerset Quarry, Bernardsville, N. J.; some of the minerals collected were zeolites, hexagonal calcite, studded with cube pyrites; amethystine quartz, chlorite and lignite in vugs. This day we also visited the Logansville Pottery at Logansville, N. J. and collected clay concretions (Mud Puppies) in many fantastic shapes.

At our September meeting Neil A. Wintringham gave a report on the field trip to Maine. He highlighted the locations visited, activities and minerals collected. Slides were shown.

Our September field trip was to the Limestone Products Company Quarry, Lime Crest, N. J., where fine xls of corundum, pyrites, spinel, sphene and aragonite—fluorescing and phosphorescing—were collected.

At our October meeting, Mr. David M. Seaman, Assistant Curator of the American Museum of Natural History, spoke on Pegmatite Minerals of New England (Maine and New Hampshire) and exhibited outstanding mineral specimens he had collected. At this meeting we also viewed the film "Surveying with the Magnetometer."

Our October field trip was to the Tilly Foster Iron Mine. near Brewster, N. Y. Ronald Januzzi was our guide. He conducted a tour of the immense dumps and assisted in identification of the 17 species collected.

On October 10th, the Lapidary Group took part in the Adult Nature Hobby Show at the Trailside Museum exhibiting lapidary and jewelry making techniques with specimens. Carl Bieling, Education Committee Chairman, made the arrangements.

The Lapidary Group have been very active. Small workshops have been formed where the beginner visits, learns how and works on the equipment of an experienced Lapidist. The results have been outstanding. Mr. Stewart C. Fulton is Chairman of this Committee.

At our November meeting Prof. E. J. Smoke, Research Specialist of Rutgers University, spoke on the importance of Ceramics to Modern Industry. Slides were shown that emphasized mankinds need and benefits from ceramics.

At our December meeting Dr. Carroll Lane Fenton, Author and Lecturer, spoke on Land of Red Rocks and Uranium. A very interesting lecture on the geology and mineralogy of the National Monument Area of Utah, Colorado, Arizona and New Mexico. Slides illustrated his speech.

Our Field Trip Committee started a "Sight Identification of Minerals" session. A panel of experienced mineralogists assist members to identify their "unknown" minerals.

Our Safety Committee has been active and with the cooperation of all members we are maintaining Good Will with all Quarry owners.

Mrs. Alexander Knoll, Secretary
532 Edgar Road
Westfield, N. J.

North Jersey Mineralogical Society

The North Jersey Mineralogical Society held its 100th meeting and celebrated its tenth birthday on December 9th, together with its annual Christmas party. The meeting was held in Paterson Museum where the organization was founded and where it holds its regular sessions.

The business session was held to its lowest possible terms, and the whole evening was devoted to fun, food, music and reminiscence. The exchange of gift minerals, always a feature of the Christmas party, was observed, and door prizes were awarded. The evening was a joint project of the standing committees on program and social features.

William C. Casperson, Curator of the Museum, who was also founder and first president of the Society, recounted the organization's early days. Seven persons were present at the first meeting in 1944, and from then on to now the Society has grown steadily until it now has approximately 180 members. Four new ones were admitted at the December meeting.

Mr. Casperson said the first few meetings were held in the business office of the Museum; then they overflowed into the mineral hall; then they were moved down to the main floor where a few display cases were pushed aside; then practically all the display cases had to be moved, as is now done each time.

He displayed two big books of history of the organization including notes, newspaper clippings, snapshots and other data also a set of the annual membership lists.

The Society has only two other past presidents: William B. Aitken of Westwood and Henry C. Mullner of Clifton, both of whom took bows.

A table full of Christmas-wrapped packages of exchange minerals were distributed by means of matching numbers. Some of the specimens were of higher quality than sometimes happens on such occasions, while a few were not so good.

In another drawing of numbers Mrs. Caroline Travis won first door prize, a copy of Dana-Hurlbut's "Minerals and How to Study Them"; the second prize, a prospector's pick, went to Miss Louise Brooks.

Warren Duncan led the club in singing several songs with words written for the occasion and also several of the familiar Christmas hymns and carols. Harold Gabriels, accordionist, accompanied. Competitive singing by a men's quartet and women's quartet, none of whom knew they were to compete, resulted in a win by the ladies who received a loving cup. The winning singers were Mrs. Charles Franz, Mrs. Edwina Wallace, Mrs. Mary Welsh and Mrs. Duke Stelpstra.

During the music period huge platters of sandwiches appeared on the table which had held gift minerals and an enormous birthday cake was unveiled on the officers' desk. Coffee and punch were served by the women members of the social committee, Miss Alypia Wendt, Mrs. Elsa Milligan, Mrs. Frank Ehman, Mrs. George Stevens and Mrs. Harold Weimann.

In spite of pouring rain, approximately 70 members and guests were in attendance. At some time after 11 o'clock the festivities ended, and so had the rain, with everybody agreeing it had been the best Christmas party the Society had held.

Marian B. Casperson
Publicity Chairman
9-11 Hamilton Street
Paterson 1, N. J.

South

Chattanooga Rock and Minerals Club (Chattanooga, Tenn.)

Meeting September 8

The meeting was held on Tuesday, the 8th, at 7:30 in the air-conditioned lecture room of the Chattanooga Gas Co. Mr. C. A. Betts, civil engineer, showed excellent color slides he had just taken on a trip to Hawaii. The scenes included views of the Grand Canyon, Arizona; Yosemite National Park in California; as well as those of Hawaii. The pictures shown were chiefly of geologic interest. Coffee was served during the discussion.

Meeting October 12

The regular monthly meeting was held on Tuesday the 12th, at 7:30 in Room 108 Science Hall, University of Chattanooga. An unusual address was given by Elsworth Brown whose subject was, "The Geography of Chickamauga Gorge." This rugged gorge penetrates Waldens Ridge several miles with limestone at the base of the mountain, gradually blending into sandstone, shale and coal seams at the top. The stream in the gorge is extremely acidulous, have a ph of 2. Mr. Brown showed beautiful close-ups of wild flowers found in the gorge where rare botanical specimens have been found.

Meeting November 9

This exceptional meeting was held Tuesday November 9, at 7:30 in Room 108 Science Hall, University of Chattanooga. Mr. Ford E. Wilson, past-president of the Geological So-

ciety of the Oregon Country, Portland, loaned the Club a choice selection of color slides showing the views and geological features of Glacier National Park and Craters of the Moon. Mr. Wilson supplied descriptions of each view and these were supplemented with appropriate comments by Prof. B. K. McGaw. An additional feature of the evening was the showing of total eclipse slides taken by Mr. H. C. Grahl of The Bronx, New York. Mr. Grahl went to Minneapolis to observe and to photograph this rare event last June.

Meeting November 30

To avoid the usual Christmas congestion of events, the December meeting was held November 30th, at 7:30 Tuesday, in Room 108 Science Hall, University of Chattanooga. Mr. Chas. J. Wilbur, District Manager, Pan Am Oil Company, addressed the Club on "The History of Asphalt." He explained that the well known Trinidad deposit is a sort of mining operation, whereas most of the asphalt used now is one fraction of petroleum cracking. This was explained by blackboard sketches. Road asphalt is an elastic, waterproof cement somewhat cheaper than concrete. The asphalt holds the sand and rock flexibly together and prevents water from entering the supporting rock bed. Roofing asphalt is oxydized by blowing air through the liquid.

George C. Olmsted
1129 James Blvd.
Signal Mountain, Tenn.

Fort Worth Mineral Club

The Fort Worth Mineral Club held its monthly meeting on Friday November 5, 1954. The program was an auction of mineral specimens, cut stone and hand wrought jewelry donated by the members.

Proceeds are to be used for a Christmas party December 3rd, at the Hilton Hotel.

Regular club meetings are held at the Fort Worth Garden Center the first Friday of each month, at 7:45. All those interested in the mineral, rock and lapidary hobby are cordially invited to attend.

Mrs. Ruby Renfro
2901 Bomar Ave.
Fort Worth 3, Texas

San Antonio Rock & Lapidary Society

The San Antonio Rock and Lapidary Society of San Antonio, Texas, elected and installed its officers for the coming year at the October meeting which was held at Witte Museum, October 11, 1954. New officers for the club for the ensuing year are: Mr. Raymond Rock, President, Mr. John Gibson, Vice President, Mrs. Ann Woodward, Secretary, Miss Eva Pirie, Treasurer and Mr Oren Striegler, one year director. Plans for the club's annual show were completed at this meeting.

The show was held October 30th and 31st in the auditorium of the Witte Museum, San Antonio, Texas. Practically every member of our club was represented by a beautiful display of their finished gem stones and jewelry items, outstanding mineral collections, and works of art such as pictures made of beautiful petrified wood, tables made of transparencies and lighted, or tables done in mosaic or inlay. There were working displays to entertain our visitors and show them how rocks are cut and polished into finished gems.

It was very gratifying after our show was over in looking over our visitors register books to see folks registered from 41 states and 8 foreign countries, as well as approximately 60 cities in our own state of Texas. We were happy to welcome them to our show, and we want to extend an invitation to our monthly meetings to anyone visiting our city. We meet the second Monday of each month in the auditorium of Witte Museum. Y'all come.

Mrs. Ann Woodward, Secy.
1238 W. Theo Ave.
San Antonio 11, Texas

Mid-West

Chicago Rocks and Minerals Society

Santa and his grab-bag were the prime interest at the December gathering of the Chicago Rocks and Minerals Society, meeting under the leadership of club president, Addison E. Avery, Mineralogical gifts were exchanged through the medium of the grab-bag.

A colored movie film, entitled "In The Beginning" was shown to the interested audience. It graphically showed the story of the earth, as interpeted by the rock layers in the walls of the Grand Canyon, an eternal record of the passage time.

Rochester Earth Science Society

Two Saturday afternoons during the summer, trips were taken to look for Lake Superior agates by the Rochester (Minnesota) Earth Science Society. These agates are found in the dry runs, gravel pits, and river banks between Rochester and the Mississippi River—about 35 miles. The most agates were found in a gravel pit on the south edge of Frontenac, Minnesota. Harold Whiting, the president, has a cruiser on the Mississippi, and the club members were treated to a boat ride at the conclusion of the trips.

On October 23 seventeen members of the Rochester Earth Science Society drove to Adel, Iowa, where they were entertained by Hal R. Straight. His collection is worth traveling hundreds of miles to see. Mr. Straight is such an enthusiastic rockhound it is a pleasure to be with him. On October 24 the group stopped at the home of Mr. B. H. Beane of Le Grand, Iowa, who is famous for slabs of fossilized crinoids and star fish, on which he has spent hours of work exposing the fossils until they

look like beautiful bas reliefs. He took us to the limestone quarry north of Le Grand where these slabs were found. Few fossils are found there now because the area where they were located is no longer worked.

The first indoor meeting of the Rochester Earth Science Society was held on October 11. Members reported on two summer trips, the Mid-West Federation Convention at Milwaukee and two special subjects—jade and roadside geology.

The program of the November meeting was a talk by Professor Duncan Stewart Jr. on Eight Strategic World Minerals, their location and uses and the effect of their importance on world affairs.

From November 15 through 21 Mr. William Brunia of Gem Cutters Supply in Des Moines, Iowa, held a display and active demonstration of lapidary machinery and material in a vacant store in Rochester. This attracted much attention to the lapidary arts and increased interest in our club.

Mrs. Dana Rogers
820 — 10½ St., S. W.,
Rochester, Minn.

Wichita Gem & Mineral Society

The Wichita Gem & Mineral Society made a field trip to Lawrence for its November trek. Dr. J. M. Jewett of the Kansas Geological Survey conducted the group on a tour of the mineral resources building at University of Kansas and also to the natural history museum. The show of the Lawrence Rock and Mineral Club was attended with a demonstration of crystal gazing' by Prof. Kenneth Rose featuring. He uses a rayoscope to project on the screen pictures showing the actual growth of microscoptic crystals of chemical compounds and metals. On the second day of the field trip the Wichita society visited fossil sites at Ottawa and Melvern, Kansas.

Arch O'Bryant
Wichita Eagle
Wichita, Kansas

Rocky Mountains

Cheyenne Mineral & Gem Society

Adam Wensky spoke on "Fluorescense, what it is", and showed some of his collection at the December meeting of the Cheyenne Mineral and Gem Society. After the program Rock identification games were played and refreshments were served.

The club meets first Friday of each month at 7:30 p. m. in the Woman's Club Room of the Carnegie Library. Visitors are always welcome.

Mrs. R. J. Laughlin, Corr. Sec.
204 E 3rd Ave.
Cheyenne, Wyo.

Rawlins Rockhounds Mineral & Gem Club

The Rawlins Rockhounds Mineral and Gem Club will be hosts to the Rocky Mountain Federation of Mineral and Gem Societies and to the Wyoming State Mineral and Gem Society on June 16, 17, 18 and 19th, 1955. The first day will be used to set up the exhibits and the show will close at 2P.M. on the 19th. The show will be non-competitive, and there will be no fee for non-commercial exhibits.

Several post-exhibit field trips are being planned, but none will be held during the show. A trip to the jade fields is on the agenda; and another to the Diamond Horn area. The latter trip may be a two-day trip, so those who wish to take this trip should come prepared to camp. Of course, everyone knows that we cannot guarantee that anyone will find diamonds and rubies in the Red Desert area; however, someone might be lucky, since they have not all been found.

More information on the show and field trips will be published after the first of the year, since plans at this time are still very sketchy.

Mrs. Vidal Jaramillo
Corr.-Sec'y.
308 Jackson St.
Rawlins, Wyo.

Tucson Gem and Mineral Society

On Monday, November 15, the Tucson Gem and Mineral Society met in the Business Administration Building at the University of Arizona to see a moving picture of the Paricutin Volcano in Mexico. The picture was made and shown by Mr. Tad Nichols, nationally known photographer. His oral description accompanying the movie made it real and vivid to the audience of more than sixty members and visitors in the audience.

Many questions were answered about the volcano, the only one to be born and grown to full size in the time of living man, and about the Tarascan Indians whose towns and fields were destroyed by it.

Mr. Nichols earliest pictures were made when the volcano was still in its youth. We saw gigantic columns of smoke and ash rising from the crater following explosions within the earth. Vast numbers of volcanic bombs were expelled during these explosions and bounded down the steep sides of the cone, witnesses lighting cigarettes on them seconds after they came to rest at the base. Volcanic ash fell on everything for miles around, smothering the vegetation until all was a barren waste, even more desolate than areas ravaged by forest fire. Night pictures showed snake-like rivers of molten lava, red, orange, yellow and white showing through the darker material of the partly cooled surface area. Often the camera was so close to the activity that the audience felt they must shrink back from the extreme heat or dodge the next volcanic bomb. It was almost a 3D effect.

Everyone was grateful for the late pictures showing towns being rebuilt and new plant

life slowly starting from the lava-covered land.

During the brief business meeting the president, Clayton Gibson, announced that two of the three entries in the State Fair from our club took ribbons. Mr. Harold Rupert won a red ribbon for cabinet specimens and Sally Rutledge an honorable mention ribbon for minatures.

Tucson Gem and Mineral Society Election of Officers

The Tucson Gem and Mineral Society met Monday evening, December 6, in room 110 of the University Library for a business meeting and election of officers. There were about thirty-five members present plus visitors from New York, Michigan and the state of Washington. Movies of some of our National Parks were shown by member Ernest Harms.

The following officers were elected for 1955:
President — Robert Fordham
Vice-president — Joseph Normart
Secretary — Mrs. Lena Marvin
Treasurer — Mrs. Irene Barber

Retiring president, Clayton Gibson, was presented with a copy of Dana's System of Mineralogy and each of the other officers with a cabinet specimen of some mineral.

The Tucson Gem and Mineral Society meets on the first and third Monday of each month and visitors are always welcome.

Mrs. Irene Barber
2854 N. Euclid Ave.
Tucson, Ariz.

Mineralogical Society of Arizona

In hunting for agates and jaspers in Arizona, says H. N. Wolcott, U. S. Geo. Survey, you will find them in the Tertiary lavas, and not in those of later origin. Mr. Wolcott gave an outline of the geology of Arizona at the Nov. 19 meeting of the Mineral Society of Arizona. Arizona's large areas of volcanic rocks, he said, are dated by their fossil remains. Where no fossilization is found and rocks have undergone changes, it is sometimes difficult to determine their age. There is no granite in Arizona, however, younger than early Tertiary.

W. Everett Berry of East Lynn, Mass., showed kodachromes of mines in Ontario, Maine and New Hampshire which produce respectively; crystal, gem tourmaline, and blue beryl.

A caravan of 24 automobiles went on the Nov. field trip to Trilby Wash and the Midnight Owl Mine where Arizona's most extensively operated pegmatite mine is located .The mine has produced many of Arizona's rare minerals, columbite, tantalite, lithium, manganese and phosphates of iron along with radioactive minerals. The materials sell by the pound, not by the ton.

Ida Smith, Cor. Secy.
2010 West Jefferson
Phoenix, Arizona

Arizona State Fair Mineral Show November 5 - 14, 1954

Lower Miami Grade School won the Phelps-Dodge Trophy for the 3rd consecutive year at the 1954 Arizona State Fair Mineral Show held in Phoenix, with a case of spectacular cabinet specimens from various states and countries.

The judges were impressed with the high quality and variety of the junior exhibits this year.

One exhibit drew pleased comment. It was that of Arthur L. Flagg III. Arthur is the grandson of Arthur L. Flagg, veteran superintendent of minerals, and curator of the Arizona Mineral Museum.

Two "Old Desert Prospector" tableaus drew wide attention. One was exhibited by Mrs. Minnie Morrow, 80, who crocheted prospector, burro, saguaros and buildings. Mrs. Morrow was a nurse in World War I and was wounded three times. She is still nursing, and collects rocks in her spare time. The other was a de luxe edition by Fred (Pop) Conner of his 1953 version operated by electricity. This year the old wooden prospector transported water with a dipper from creek to sluice box, while the burro switched his tail and awaited the outcome. Once the old fellow dipped up a gold fish that had to be rescued by Pop Conner.

The most outstanding adult exhibit was the meteorite display of Dr. and Mrs. H. H. Nininger. Of special interest was a diamond in one of the meteorites.

"Arizona's Meteor Crater," says Dr. Nininger, "contains the only known meteorite "fall" in the world (except a small one in Russia) that has yielded diamonds."

About 40 diamonds have been found by Dr. Nininger, himself, in Arizona meteorites. Dr. Nininger, who is director of Meteorite Museum at Sedona, Arizona, is working on an interesting theory based upon scientific calculations, regarding the origin of these diamonds.

The exhibit was a fascinating sample of the several thousand specimens in Meteorite Museum, which is the only exclusive meteorite museum in the U. S., possibly in the world.

Meteorites were shown containing minerals never found upon the earth; cohenite and schreibersite. Of no known value commercially, they are the constituents that render a meteorite so hard that it is difficult to cut.

The exhibit showed how meteorites can be identified by their etchings. Each meteorite fall has its own individual pattern of etchings. These are revealed by cutting and washing with a solution of nitric acid. These etchings are due partly to chemical composition, length of time in cooling, and other, unknown influences.

Three classes of meteorites were represented; the stony (aerolites), the metallic (siderites), and stony-iron (pallasites and mesosiderites), the stony predominating. Those from Arizona's Meteor Crater are metallic.

"The best scientific theories regarding the

origin of meteorites," says Dr. Nininger, "are that they are fragments from exploded planets.

Of the 1450 meteor falls known in the museums of the world, over 600 are represented in Arizona's Meteor Museum.

Featured among the fluorescent minerals were two floral sprays made of different fluorescent minerals by Dr. Charles W. Bullock of Buffalo, N. Y. (the exhibit is a gift to the Arizona Mineral Museum from Dr. Bullock-; and "Lil Dudette", theme of the '54 Fair, done in fluorescent minerals.

A cameo exhibit from Arthur L. Flagg's collection contained 2 emu eggs with carvings by Australian aborigines. One dated back nearly 200 years. The other was carved about 75 years ago by Chief King Billy, one of the 3 surviving aborigines. One rare cameo was carved from a fragment of emu shell. Three types of cameos were represented in the exhibit in stone and shell; the raised designs, the intaglios, and the cuvette. One sea shell with raised design was made into a lamp.

Other outstanding displays were: 35 different crystal patterns, each represented by its own special mineral; a collection of tumbled gems in rose quartz, copper ores, agate, petrified wood, sodalite and jade, by Mr. and Mrs. Fred Bitner; flowers by Leslie Vance, carved from Arizona gem stone; 48 different copper minerals including Arizona's newest mineral, Murdochite; and Arizona's uranium ores.

A collection of fine kodochromes by Floyd Getsinger were displayed. The pictures were of micro-mounts and were enlarged from 1 to 50 times.

Displays of thumbnails, jewelry and polished pieces were more beautiful this year than ever.

Ida Smith, Pub. Cor.
2010 West Jefferson
Phoenix, Arizona

West

East Bay Mineral Society, Inc.

October brought the East Bay Mineral Society some very interesting visitors, among them being Dr. Stenbuck, President of the New York Mineralogical Society and also Mr. Mitchell, the Vice-President. We were pleased to have them attend one of our regular meetings and give us some background of their society and also to see some of the specimens collected in their area. Also visiting us was Dr. Levy of the University of Berlin. October also gave us the opportunity of hearing Bob Deidrick speak to our Society on "Gold". Mr. Deidrick is well known to a great many people for his teaching and knowledge of minerals. The facilities to allow all the members present to try their hand at gold panning were provided—the gravel had been well "salted" and everyone got to keep the gold they panned.

E.B.M.S. also had a most successful field trip to Clear Creek in San Benito Co. for Jadeite and agate and quartz crystals. Forty-five members made the overnight trip and everyone had more material of good quality than they could carry home.

November also promises to be an interesting month. Harold and Nathalie Mahoney will be showing their interesting film "The Face of The Land" as published in Life Magazine. We will also be honored to have Mr. Stinson from the California State Bureau of Mines who will talk to us on "Uranium".

Canada

Thunder Bay Mineralogy & Lapidary Society

At 8:30 o'clock on the morning of July 12th, 1954, the Tug, Ronald L., left Rossport, Ontario, for a tour of Wilson, Salter, Raymond and Simpson Islands—twelve miles distant. There were twenty members and three guests on board. The weather was cloudy and cold, and the lake was a bit choppy.

By the time we reached Wilson Island, our first port of call, the sun had managed to break through the clouds and the wind had abated considerably. About sixty yards off shore, the dinghy, which had been riding the waves at the rear of the tug, was brought alongside and the first load of passengers embarked for the island in search of Greenstones. It was necessary to make two trips to transport all the members of the group. The beach was combed and some very good specimens were found. One enthusiast doffed his boots and socks and waded out from shore in hopes of finding something worthwhile.

Our next port of call was Salter Island, where the beach was combed in search of Agates. After a picnic luncheon, a meeting was held with Mr. Garratt, President, presiding. The minutes of the previous meeting were read and approved by motion of Dr. P. Wenger and seconded by Mr. James Baillie. It was moved by Dr. H. Quackenbush and seconded by Mr. Paul Miller that a cheque for $40.00 be issued to pay for the use of the tug, and that the members present reimburse the Club at the rate of $2.00 each, the children to be exempt.

Dr. Wenger agreed to send an account of the trip to the Times Journal and the News Chronicle.

It was suggested that Mr. Max Hurtig be asked to display his collection of Stones and Minerals at the Canadian Lakehead Exhibition.

After the meeting was adjourned we left for Raymond Island in search of Blue Agates. By this time the lake was quite rough, and landing was a little difficult. The trail over the cliff to the opposite side of the island where the Agates are was a little too arduous for the feminine members, so we were taken over to Simpson Island, directly across the narrow channel, where some very good specimens were found. Miss Bolt found a beauty.

When we were on board again and ready to set sail, noses were counted and it was discovered that one was missing. The Captain gave two sharp blasts of the whistle and then we waited, all eyes scanning the rocky shore. Then another blast of the whistle and more anxious waiting. What could have happened. Could it be that he was lost on that lonely island; or had fallen and broken a leg; or perhaps his crumpled form was lying at the bottom of a crevasse? The suspense was unbearable so a search party set out for shore. When the dinghy was about one hundred feet from the tug, a minute figure was seen scurrying along the shore from the opposite direction. A shout of joy went up from those on board. The attention of those in the dinghy was attracted and they changed their course and rescued the missing nose—Jim Baillie.

Next we called at Fishermen's Cove. The shore was of slate formation and not very fruitful so we did not stay long. The tug was close to shore and when the Captain tried to back up into deeper water he discovered that the stern was stuck on the mud bottom. The members were asked to stay in the bow of the boat, and after considerable manoeuvring we were released and headed up the channel. Then, we discovered that Dr. G. Jeffrey and Mr. P. Miller were still on shore. The Captain gave a warning blast of the whistle and it was not long before they appeared around the end of the island—they had gone in search of Amethyst. They were picked up by the dinghy and transported to the tug. The dinghy was fastened to the stern and we headed for Rossport. It was then about twenty minutes after four o'clock. The trip in was very rough, but we docked at twenty minutes to six.

After comments on the trip were made, good-byes were said and each party left independently for home.

A desire that had been held in abeyance for four years had finally been fulfilled. The weather was cold and stormy, but an enjoyable day was spent by all..

(Rossport, Ontario, is 170 miles east of the Pigeon River Boundry, on the shore of Lake Superior.)

Beatrice Gilby
264 Ray Court
Port Arthur, Ont. Canada

OBITUARY NOTICES

William H. Otersen, Jr.

The following letter, dated Dec. 4, 1954, was sent in by Miss Sally E. Davis, President of the New Haven Mineral Club.

"I am enclosing a clipping of the death of William Otersen of Grove Place, West Haven, Conn., who died in his office Dec. 1, 1954.

Bill had been a member of our club since 1933 when his wife, Lillian, organized it. The Otersens enjoyed collecting minerals from all over the world and now have one of the finest home collections in this area. Mr. Otersen had also developed the skill of cutting and polishing to an exceedingly high degree. He was known and well liked by all."

The clipping reads:

William H. Otersen, Jr.

William H. Otersen Jr., purchasing agent for the Seamless Rubber Co. for 36 years, died suddenly this morning. He was 62 years of age.

Mr. Otersen was stricken with a heart attack at work and died shortly after at the Grace-New Haven Community Hospital. He lived at 16 Grove Place, Prospect Beach, West Haven.

He came to the Seamless Rubber Co. in 1918 and was a member of the National Association of Purchasing Agents for more than 20 years. He was recently honored by the company upon the completion of 35 years of service.

He is survived by his wife, Mrs. Lillian M. Daniels Otersen and a brother, Lewis W. Otersen of Brooklyn, N. Y.

— New Haven Register, Dec. 1, 1954

Charles Palache, Mineralogist, Dies.

CHARLOTTESVILLE, Va., Dec. 5 — Dr. Charles Palache, eighty-four, professor emeritus of mineralogy at Harvard University, died today at his home here. Dr. Palache, a graduate of the University of California, was a member of the Harvard faculty from 1895 to 1940. From 1923 to 1940 he was curator of the Harvard Mineralogical Museum.

He obtained the degree of Doctor of Philosophy at the University of California in 1894 after obtaining his master's degree at Heidelberg. He was the first recipient of the Roebling Medal, in 1937, as the author of several textbooks and revised Dana's "System of Mineralogy." He was a former president of the Geological Society of America and Mineralogy Society of America, of which he was honorary president at his death. He was an honorary member of several foreign mineralogical societies and was a member of the National Academy of Sciences.

Three daughters, Mrs. Charles Gregory, Mrs. Russell Barker and Miss Alice Palache, survive.

— New York Herald Tribune, Monday, Dec. 6, 1954

Publications Recently Received

Silver Lake Talc deposits in Calif.

The Silver Lake Talc deposits in San Bernardino County, California are the subject of a new Special Report just released by the California Division of Mines according to a statement made Oct. 26, 1954, by Olaf P. Jenkins, Chief of the Division.

The Silver Lake deposits, located in the Mojave Desert of southeastern California, have yielded a steady production of talc for the past 35 years. Talc mined from the deposits recently has gone chiefly into the manufacture of wall tile, though previously it was used by the ceramic, paint, and rubber industries.

The new publication, SPECIAL REPORT 38, is entitled, "Geology of the Silver Lake talc deposits, San Bernardino County, California." Written by Lauren A. Wright, a member of the staff of the California Division of Mines, the report discusses the geology and geologic history of the mine area, and describes the talc bodies and workings in detail. Dr. Wright has included as an appendix a discussion of the petrography and metamorphism of the principal rock units.

SPECIAL REPORT 38 is a well-illustrated, 30-page book that includes 3 large-scale, colored maps in a pocket in the back . It is priced to sell at $1.00, plus 3 cents tax for California residents. Copies may be ordered from the Division of Mines offices in the Ferry Building, San Francisco 11, or may be purchased over-the-counter from the Ferry Building offices or from the Division's offices in Los Angeles at 21 West First Street; in Redding at the Natural Resources Building, Cypress and Lanning; or in Sacramento, in the Division's offices on the third floor of the State Office Building.

Barstow Quadrangle, California

Barstow quadrangle, an area in the Mojave Desert, is the subject of a new report just issued by the Division of Mines, Olaf P. Jenkins, Chief of the Division announced Dec. 1, 1954.

The Barstow quadrangle lies in San Bernardino County in the heart of the Mojave Desert, and embraces nearly a thousand square miles. The report, issued as the Division's Bulletin 165, is one of the few detailed studies published concerning the geology and mineral deposits of this vast desert region.

Among the mineral deposits described are the metallic ores of gold, silver, iron, copper, lead, zinc, and tungsten. Underground water resources—always of interest in a desert area—and the non-metallic mineral resources, both those that have been exploited and those of potential value, are also described in detail. The non-metallic resources include deposits of limestone, dolomite, ganister, barite, magnesite, pyrophyllite, mica-quartz fillers, and the ornamental rocks and minerals such as marble and granite.

Accompanying the main article in the Bulletin, which is entitled, "Geology and Mineral Deposits of Barstow Quadrangle, San Bernardino County, California," is a short paper bearing the title, "Thermal Properties of Ceramic Materials from Barstow Quadrangle, California." It was prepared by Joseph A. Pask, Professor of Ceramic Engineering at the University of California, in cooperation with the author of the remainder of the Bulletin, Oliver E. Bowen, Jr., staff member of the Division of Mines. The report by Pask and Bowen presents the results of some laboratory tests of some peculiar ceramic materials found in the area.

Those who are interested in exploiting the mineral resources of this thousand-mile area should find the bulletin invaluable. Those who are interested in exploring the region should also find it of great interest, as the general geologic history is interestingly presented, as is the history of the desert physiography. The many fine illustrations-nearly 90 in all—show in detail the rocks of the region and their relationships to one another; folded in a pocket in the back are reproductions of five aerial photographs that illustrate many of the topographic features and indicate the distribution of the rock units as well.

Scientists, amateur mineralogists, desert lovers, and prospectors will find the maps accompanying Bulletin 165 of great value. One, a geologic map, is lithographed in color on a topographic base another, also on a topographic base, shows the mineral deposits.

Cloth-bound, Bulletin 165, consisting of 208 pages, 84 figures, and 9 plates, is priced at $3.00 plus 3% tax for California residents. The two maps, plates 1 and 2, and a series of structure sections comprising plate 3, may be purchased separately for $1.00 plus tax. Copies may be secured over-the-counter at the Division of Mines offices in the Ferry Building, San Francisco 11; in Los Angeles at 217 West First Street in Sacramento in the Division's offices on the third floor of the State Office Building or in Redding at the Natural Resources Building, Cypress and Lanning. Mail orders can be filled from the San Francisco offices.

Romanella Issue New Price List

R. C. Romanella, 2266—93rd St., Jackson Heights, L. I., N. Y., recently issued his new "Price List 1955." This is a 3 page publication featuring fine faceting rough, fine cabochon quality rough, crystal specimens (tourmaline, topaz, diamond), and cut stones.

Minerals Unlimited new price list

Minerals Unlimited, 1724 University Ave, Berkeley 4, Calif., have issued a 6 page price list covering fine mineral specimens. The minerals come from all over the world. If you are interested in fine minerals, get a copy of this new price list.

Albanese's latest price list

John S. Albanese, Box 221, Union, N. J., issued last November his "Latest Price-List of Fine Mineral Specimens." This is a 12 page publication (List No. 93) and it features selected specimens from an old collection recently acquired. As most items listed are one of a kind, it is suggested that a copy of the price list be obtained immediately so that choice items be ordered before they are all gone.

Ohio Publication

A. W. Marion, Director, Ohio Department of Natural Resources announces the publication by the Division of Geological Survey of a new report, GEOLOGY OF COSHOCTON COUNTY, by Raymond E. Lamborn: Bulletin 53, 245 pp., maps, 1954. Price $3.00 plus 9 cents tax in Ohio. Copies may be obtained from the Division of Geological Survey, Room 106, Orton Hall, Ohio State University, Columbus 10, Ohio.

A physical description of the sequence of rocks in Coshocton County which include sandstone, limestone, clay, and coal, with an explanation of their economic utilization. John H. Melvin, Chief of the Division of Geological Survey, points out that the issuance of this publication at this time is of particular interest because of the current activity in exploration for oil and gas in the western part of the county.

THE TERM "DIAMONDS"

By Claude H. Smith
Box 291, Geneva, N. Y.

In reading the July and August 1954 issue of ROCKS AND MINERALS I noticed an article entitled "A still larger Arkansas Herkimer "Diamond" by Byron C. Marshall.

I personally thought that the article was well written and should be of interest to every mineral collector. I could find nothing wrong with the article itself but thought that the title was very misleading to the beginners in mineralogy.

There is no such thing as an Arkansas Herkimer "Diamond". Mr. Marshall uses the correct term later in the article by referring to the Arkansas "Herkimer" type. The true Diamond of course refers to native crystallized carbon. But the term "Diamond" when used in association with the clear colorless, sparkling rock crystal applies only to appearance and not chemical composition. This association by appearance is especially true with specimens from Herkimer County, N. Y., particularly the Middleville area where, according to some authorities, are found the most perfect and brilliant rock crystals in the world.

Now that we have accounted for the association of the term "Diamond" with the rock crystal, let us similarly establish the association of a term such as Herkimer "Diamond" with a specific locality. This can best be done perhaps by referring to ROCKS AND MINERALS for February, 1937, in which 32 locality names are used in association with the term "Diamond". This issue was a Special Rock Crystal Number and carried a Rock Crystal Glossary on pages 56 to 61. In this glossary was listed 32 "Diamonds" running from the Alaska "Diamond" from Alaska and the Alencon "Diamond" from France to the Vallum "Diamond" from Tanjore District, India, and the Wicklow "Diamond" from Ireland. There are probably many more less well known "Diamonds" for I have letters in my files from collectors all over the United States referring to a local "Diamond" named after some local feature.

From the above it can be seen that where clear, sparkling rock crystals are found, it is not uncommon to call them "Diamonds" and to give them the name of the locality in which they are found. Thus the name Herkimer "Diamond" should only be used when the specimen has been found in Herkimer County, N. Y. Similar appearing rock crystals found in other localities might be also called "Diamonds" but they should not be called Herkimer, but given the name of the locality in which they are found.

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